

“Mathematics has beauty and romance.

It’s not a boring place to be, the mathematical world.

It’s an extraordinary place; it’s worth spending time there.”

About the course :

This course is an introduction to the ideas and techniques of one-variable calculus, intended for students who are interested in science and mathematics.

Calculus is the most important mathematical tool we have for understanding the world around us. Its development caused a revolution in science; its principles are the basis for the mathematical progress of physics, chemistry, economics, and engineering.

The language of calculus is the one in which we write the equations of general relativity, of stresses and strains, of quantum mechanics. It is the language in which we express the laws of electromagnetism and the evolution of dynamical systems. It is the method by which we find the most efficient designs or paths, investigate instantaneous behaviour, and reassemble infinitely many pieces together into a whole.

Many courses on calculus concentrate only on the computational aspects : how to calculate derivatives and integrals, or transforming physical problems into calculus ones.

We will learn to do these things, but in this class we will also learn more : we also focus on understanding the ideas that underlie calculus and how to use them to see more deeply into the mathematical and physical world.

Goals :

1. Being able to use the ideas in the course fluently. Indicators of fluency include : being able to use the ideas in a new situation; being able to use the ideas in a different order or manner than they have been presented; being able to construct minor extensions or use minor variations of the ideas.
2. Being able to write to write clear, clean, and well-reasoned mathematical arguments.
3. Understanding the standards for such arguments.
4. Learning how to work through and solve more difficult problems, particularly those which may seem confusing at first and require time to digest and understand.
5. Mastering the underlying material of the course : limits, continuity, differentiation, integration, convergence.
6. Being able to compute limits, derivatives, integrals, and infinite sums.

Grading Scheme :

Homework	20%	(1% per assignment)
In-class exams (two each term)	30%	(7.5% per exam)
End-of-term exams	50%	(25% per exam)

There are twelve homework assignments each term, and the lowest two grades each term will be dropped when computing the homework mark.

The homework is due Tuesday by 22:00, and is submitted via Crowdmark. The first homework assignment is due on Tuesday, September 12.

Web resources :

There is an OnQ site for the course with links to the above pages, this syllabus, the latest homework assignment, and where you will be able to check your current grades.

Tutorials :

The tutorials are a chance to talk over some of the ideas in the class that week with your fellow students, and ask questions about those ideas to the instructors. In the past years, most of the students who attended the tutorials, had good exam results and understood the topics more deeply.

Important Dates :

	FALL TERM	WINTER TERM
First in-class exam	Oct. 5	Feb. 8
Second in-class exam	Nov. 9	Mar. 14
End of term exam	TBA	TBA

Other resources :

The *Math Help Center* in Jeff 201, is open from 9:30am to 6:30pm, and there are tutors there who can help answer your questions.

Textbook : *Calculus, Early Transcendentals*, by James Stewart, ninth edition (earlier editions are fine too).

Academic Integrity : As in every course at Queen's, adherence to the University's guidelines on academic integrity is both expected and required. A description of the expectations can be found at

<https://www.queensu.ca/academicintegrity/students-and-academic-integrity>.

A more detailed discussion can be found in part 1 of the Academic Regulations and University Policies :

<https://www.queensu.ca/academic-calendar/arts-science/academic-regulations/>

In particular, while it is fine to discuss homework problems with other students, the written work submitted must be your own.

Academic integrity as applied to the homework.

This is my second time teaching Math120, and sometimes I will use old homework questions, which may mean that it is possible to find old solutions. Copying the solutions without acknowledgement is plagiarism, as covered under the regulation 1.2.1(i) in 'Departures from academic integrity'. On the other hand, even if the use of the solutions is acknowledged, what grade should copying someone else's answers merit?

Most importantly, struggling with the homework is the way that one learns the material. Copying another person's solutions (anyone else's solutions) is akin to watching videos of someone else lift weights. At the end of all that watching, it would be ridiculous to expect that you yourself have gotten stronger. Similarly, you will only really understand the material if you yourself put in the work to understand the homework.

Copyright of Course Materials

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Instructors :

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Accessibility Statement and Accommodations Statement :

Queen's University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact Student Wellness Services (SWS) and register as early as possible. For more information, including important deadlines, please visit the Student Wellness website at :

<http://www.queensu.ca/studentwellness/accessibility-services/>

Academic Considerations for Students in Extenuating Circumstances :

Queen's is also committed to providing academic consideration to students experiencing extenuating circumstances that are beyond their control and which have a direct and substantial impact on their ability to meet essential academic requirements. The webpage <https://www.queensu.ca/studentwellness/forms#:~:text=Queen's University is committed to short-term illness>). contains links to the policy statement concerning such academic consideration, as well as to the procedure to follow in such situations.

Statement on the Location and Timing of Final Examinations :

As noted in Academic Regulation 8.3, "The final examination in any class offered in a term or session (including Summer Term) must be written on the campus on which it

was taken”, while Regulation 8.2 states that the final exam “must be written at the end of the appropriate term or session at the time scheduled by the Examinations Office.”

The exam period is listed in the key dates prior to the start of the academic year in the Faculty of Arts and Science Academic Calendar and on the Office of the University Registrar’s webpage. A detailed exam schedule for the Fall Term is posted before the Thanksgiving holiday; for the Winter Term it is posted the Friday before Reading Week, and for the Summer Term the window of dates is noted on the Arts and Science Online syllabus prior to the start of the course. Students should delay finalizing any travel plans until after the examination schedule has been posted. Exams will not be moved or deferred to accommodate employment, travel/holiday plans or flight reservations.

Personal message of the instructor to the students:

1. Feel free to ask questions without fear of making mistakes. Errors arise from alternative interpretations of mathematical ideas (your attempt to create meaning) and they represents opportunities to learn.
2. Work together. The best math comes from collaboration and friendship.
3. Don’t perceive the exercises as passive recipes. Think!
4. Read a calculus book. The act of taking a math book and reading it leads to independence and helps to improve your ability of talking about math .