MATH 180: DIFFERENTIAL CALCULUS
Course outline

BASICS

All announcements, homework assignments and additional resources will be posted on the Canvas course page.

The teaching team and types of teaching. This course is taught by a team of faculty, graduate and undergraduate instructors. Contact information for the teaching team is available in the "Contacts" section of the Canvas course page.

Most weeks will include the following classes.

1. One 80-minute *lecture*, taught by the faculty instructor. The lecture will establish the main results and introduce the theoretical framework of the week.

2. Two 50-minute *recitations*, taught by the recitation instructors. In recitations, you will extend and explore the material introduced in the lecture.

3. One 20-minute *quiz*.

Attendance is mandatory. In your lectures, and especially in your recitations, you are required to participate actively — to ask questions, propose solutions and extend results.

Textbook. There are a number of free online textbooks which are suitable for this course. The best is the CLP textbook, written by the UBC mathematicians Joel Feldman, Andrew Rechnitzer and Elyse Yeager. There is a link to this textbook in the "Additional resources" section of the Canvas course page.

Piazza. Piazza is an online forum where you are encouraged to post and answer questions. There is a link to Piazza on the Canvas course page.

Office hours. Office hours provide you with opportunities to ask questions about course material or mathematics in general. They are jointly staffed by multiple instructors. Office hours will take place on on Wednesdays from 3:00-5:00 in MATH 203. You are also welcome to book appointments over email with the faculty instructor.

SCHEDULE

Important information is contained in the course schedule, which is available on the Canvas course page. This is a very important document. Download a copy and display it prominently.

Events for section 101 are indicated in red. Lectures and quizzes for section 101 take place in CIRS 1250. Recitations take place in the rooms indicated on the Student Service Centre at
`courses.students.ubc.ca`.
Events for section 102 are indicated in blue. Lectures and quizzes for section 102 take place in MATX 1100. Again, recitations take place in the rooms indicated on the Student Service Centre at
`courses.students.ubc.ca`.
Students assigned to recitation W1K must also attend D1K. Students assigned to recitation W1L must also attend D1L. Students assigned to recitation W1M must also attend D1M. Students assigned to recitation W1P must also attend D1P.

An approximate schedule of topics is below.

Dates	Topics
Sept. 6 - 17	Limits, asymptotes and the derivative
Sept. 18 - 24	Derivatives of sums, products and quotients
Sept. 25 - Oct. 1	Derivatives of trigonometric functions
Oct. 2 - 8	Derivatives of exponential and logarithmic functions
Oct. 9 - 22	The Chain Rule, implicit differentiation, related rates and inverse trig functions
Oct. 23 - Nov. 5	Curve sketching
Nov. 5 - 19	Optimization
Nov. 20 - 30	Linear and higher degree approximations

ASSESSMENTS

To achieve success in this course, assigned work is necessary but not sufficient. You must work through extra problems, some of which will be provided to you. *The expectation is that you spend at least eight hours per week outside the classroom on this course.*

Assignments. There are eight assignments, each with an online part and a written part. Both parts may be accessed through the Canvas course page.

Online part. The online problems are on the WeBWorK platform. They develop your technical and computational skills.

Written part. The written problems develop your ability to synthesize information and construct arguments. Your answers should be in the form of explanations written in plain English with mathematical notations. You will be graded on the mathematical, logical and grammatical coherence of your explanations, as well as on their economy and creativity. The written problems will generally be at a much higher level than the online problems; it is not unusual to spend several days working on them. Solutions to the written problems must be handed in at the beginning of the lecture on the due date. Late assignments will not be accepted. *You are encouraged to work on homework assignments together. However, you must write your solutions independently.*

You are required to type solutions to your written assignments. It is strongly recommended that you use LaTeX, a document preparation system widely used in mathematics and the sciences. The course webpage has a link to a free online LaTeX compiler.

Quizzes. There are eight 20-minute quizzes meant to assess your technical and computational skills. The questions on quizzes are similar to WeBWorK problems. Section 101 and section 102 write different quizzes, and the quizzes in each section are randomized.

Quizzes are indicated in bold on the course schedule document. Quizzes for section 101 take place in CIRS 1250. Quizzes for section 102 take place in MATX 1100. Calculators are not permitted on quizzes.

Tests and exams. There will be one 90-minute midterm exam on October 16. This is indicated in bold on the course schedule document. The section 101 midterm will take place in CIRS 1250. The section 102 midterm will take place in MATX 1100. The 150-minute final exam will take place in December. Calculators are not permitted on tests and exams.

Grade summary. Your final grade is based on assignments (20%), quizzes (10%), the midterm exam (20%) and the final exam (50%).

Your lowest assignment grade and quiz grade will be dropped. However, grades of zero assigned for academic violations will never be dropped.