MATH 180: DIFFERENTIAL CALCULUS
Course outline for Section 101

RESOURCES

Webpage. All homework assignments and announcements will be posted on the course webpage, which is

www.math.ubc.ca/~fsl/180.html.

The teaching team and types of teaching. This course is taught by a team of faculty, graduate and undergraduate instructors. In general, each week will include the following classes.

1. One two-hour *lecture*, normally on Monday, taught by the faculty instructor. The lecture will introduce the theoretical framework and main results for the week.

2. Two one-hour *recitations*, later in the week, taught by the recitation instructors. In recitations, you will extend and explore the material introduced in the Monday lecture.

In all of your classes, but particularly in your recitations, you are required to participate actively — to ask questions, propose solutions and extend results. Attendance is mandatory.

Contact information for the teaching team is as follows. "FI", "GRI" and "URI" refer to "faculty instructor", "graduate recitation instructor" and "undergraduate recitation instructor", respectively.

Name	Role	Email	Office hours	Recitations
Rob Fraser	GRI	rgf@math.ubc.ca	Wednesday 10:00-11:00	W1I, W1F
Masomeh Jamshid-Nejad	GRI	masomeh@math.ubc.ca	Wednesday 11:00-12:00	W1D, W1G
Jordan Lee	URI	jordan_lee_@hotmail.com	Wednesday 10:00-11:00	W1F
Fok-Shuen Leung	FI	fsl@math.ubc.ca	Tuesday 10:00-11:00, Wednesday 10:00-12:00	-
Xiaowei Li	GRI	xli@math.ubc.ca	Wednesday 11:00-12:00	W1B, W1J
Kevin Multani	URI	kevinmultani@gmail.com	Wednesday 10:00-11:00	W1B, W1C
Lena Podina	URI	lena.podina@gmail.com	Tuesday 10:00-11:00	W1D, W1G
Joanna Tu	URI	tu.joanna7@gmail.com	Wednesday 11:00-12:00	W1I
Emily Tyhurst	URI	emily@dogmead.com	Wednesday 11:00-12:00	W1A, W1E
Marjan Zare	GRI	marjan.zare@math.ubc.ca	Wednesday 10:00-11:00	W1A, W1C W1E
Renee Zhu	URI	renaisco.z@gmail.com	Wednesday 10:00-11:00	W1J

Office hours. You are encouraged to attend office hours to ask questions about course material or mathematics in general. Office hours will take place on Tuesdays from 10:00 to 11:00 in MATH 114; and on Wednesdays from 10:00-12:00 in AUDX 142. You can find out which instructors will generally be present from the table above. You are also welcome to book appointments over email.

Piazza. Piazza is an online forum where you are encouraged to post and answer questions. There is a link to Piazza in the "resources" section of the course webpage.

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 "resources" section of the course webpage.

ASSESSMENT

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 with two parts: an online part and a written part.

Online part. The online problems train your technical and computational skills. They are on the WeBWorK platform, which may be accessed through the course webpage. You will need your CWL login and password to access WeBWorK.

Written part. The written problems train 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. One of 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 it. Solutions to the written problems must be handed in at the beginning of class 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 10-minute quizzes, which take place in class. These are meant to assess your technical and computational skills.

Quizzes and assignments are paired. *You must pass the quiz in order to have your assignment counted, and you must pass the assignment in order to have your quiz counted.*

Exams. There will be one 90-minute midterm exam on October 25 at 6:00 p.m. 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 (15%), quizzes (15%), the midterm exam (20%) and the final exam (50%).

SCHEDULE

An approximate schedule of topics is below.

Dates	Topics	Notes
Sept. 6 - 8	Curves, limits and asymptotes	No Tuesday or Wednesday recitations 3:00 lecture in CIRS 1250 on Sept. 6
Sept. 11 - 15	The derivative	
Sept. 18 - 22	Derivatives of sums, products and quotients	A1 and Q1 on Sept. 18
Sept. 25 - 29	Derivatives of trigonometric functions	A2 and Q2 on Sept. 25
Oct. 2 - 6	Derivatives of exponential and logarithmic functions	A3 and Q3 on Oct. 2
Oct. 9 - 13	The Chain Rule, implicit differentiation and inverse trigonometric functions	No class on Oct. 9
Oct. 16 - 20	Related rates	A4 and Q4 on Oct. 16
Oct. 23 - 27	Curve sketching, Part I	Midterm Oct. 25
Oct. 30 - Nov. 3	Curve sketching, Part II	A5 and Q5 on Oct. 30
Nov. 6 - 10	Optimization, Part I	A6 and Q6 on Nov. 6
Nov. 13 - 17	Optimization, Part II	No class on Nov. 13
Nov. 20 - 24	Linear and higher degree approximations	A7 and Q7 on Nov. 20
Nov. 27 - Dec. 1	Review	A8 and Q8 on Nov. 27