

**MATHEMATICS 120 Section 101**  
**(Honours) DIFFERENTIAL CALCULUS**

Math 120 is the honours version of Math 100, covering mostly the same topics, but in greater foundational depth and with more emphasis on harder and/or theoretical exercises.

**Prerequisite:** MATH 12. High-school calculus and one of (a) a score of 95% or higher in BC Principles of Mathematics 12 or Pre-calculus 12; or (b) a score of 95% or higher in the BC provincial examination for Principles of Mathematics 12 or Pre-calculus 12; or (c) BC Principles of Mathematics 12 or Pre-calculus 12 with a letter of invitation from the Mathematics Department based on performance in the Euclid Contest; or (d) permission from Mathematics Department Head.

**INSTRUCTOR:**

- Joel Feldman
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- 604-822-5660
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- <http://www.math.ubc.ca/~feldman/>
- office hours: Monday 1:30–2:30, Tuesday 11:00–12:00, Thursday 2:00–3:00

**TEXT:**

**Robert A. Adams and Christopher Essex, Calculus: Single Variable**, (or Calculus: A Complete Course) seventh edition or any earlier edition. (The earlier editions have Adams as the sole author.)

I will post all handouts, problem sets, final grades, etc. on <http://www.math.ubc.ca/~feldman/m120/>

**TOPICS:**

chapter		lecture hours
	Preview and Review functions, absolute values, inequalities, preview of calculus	3
1	Limits and Continuity limits of sequences and functions, limit laws, continuity, Intermediate Value Theorem	5
2	Differentiation tangents and differentiability, higher derivatives, differentiation rules (including chain rule), implicit differentiation, Mean Value Theorem and applications (monotonicity, concavity)	10
3	Elementary Functions inverse functions and their derivatives, exponential and logarithmic functions and their derivatives, exponential growth and decay, derivatives of trig and inverse trig functions	7
4	Applications curve sketching, maximum and minimum problems, related rate problems, l'Hôpital's Rule	8
4	Approximation linearization (with error estimate), quadratic and higher approximations, Taylor polynomials and Taylor's theorem with Lagrange remainder, Taylor series for exp, sin, cos	7

**GRADING:**

- There will be weekly problem sets. They will account for about 5% of the final mark.
- There will be two midterms (Tuesday, October 2 and Tuesday, November 6) with each accounting for about 20% of the final mark.
- The final exam will account for about 55% of the final mark.
- Grades **will probably be scaled**.

### Schedule of Problem Sets, Quizzes and Midterms

	Mon	Tues	Wed	Fri
Sept	3 no class	4 no class	5	7
	10	11 Problem Set 1	12	14
	17	18 Problem Set 2	19	21
	24	25 Problem Set 3	26	28
Oct	1	2 Midterm 1	3	5
	8 no class	9 Problem Set 4	10	12
	15	16 Problem Set 5	17	19
	22	23 Problem Set 6	24	26
Nov	29	30 Problem Set 7	31	2
	5	6 Midterm 2	7	9
	12 no class	13 Problem Set 8	14	16
	19	20 Problem Set 9	21	23
	26	27	28	30