

## MATHEMATICS 101 Section 101

### Integral Calculus with Applications to Physical Sciences and Engineering

This is an honours version of Math 101, covering mostly the same topics, but in greater depth and with more emphasis on harder exercises. Some precise definitions and statements of theorems will be given, but only limited theoretical facility will be expected of students.

**Prerequisite:** A grade of 5 in AP Calculus AB, or 75% on the Calculus Challenge exam. Registration is only possible through the Mathematics department. For registration please email [lamb@math.ubc.ca](mailto:lamb@math.ubc.ca) or phone 604-822-2666.

#### INSTRUCTOR:

- o Joel Feldman
- o Math building room 221
- o 822-5660
- o [feldman@math.ubc.ca](mailto:feldman@math.ubc.ca)
- o <http://www.math.ubc.ca/~feldman/>

#### TEXT:

**Adams, Single Variable Calculus**, fifth edition.

I will post all handouts, problem sets, final grades, etc. on the web at

<http://www.math.ubc.ca/~feldman/m101/>

#### TOPICS:

chapter		lecture hours
5	Definite Integrals and the Fundamental Theorem area under curves, Riemann sums and the definite integral, properties of the definite integral, the Fundamental Theorem of Calculus, the average value of a function	8
6	Techniques of Integration substitution, integration by parts, integrals of trig functions, inverse trig substitutions, partial fractions	7
6	Numerical Integration trapezoidal rule and error estimate, Simpson's Rule	4
6	Improper Integrals	2
7	Applications of Definite Integrals areas, volumes, arc length, surface area, continuous probability density functions, expectation, variance, complex numbers, differential equations	11

#### GRADING:

- o There will be weekly problem sets. The best seven of these will account for about 10% of the final mark.
- o There will be two midterms (Wednesday, Oct 9 and Wednesday, Nov 6) accounting for about 40% of the final mark.
- o The final exam will account for about 50% of the final mark.
- o Grades **will probably be scaled**.

### Schedule of Problem Sets and Midterms

	Mon	Wed	Fri
Sept	2 no class	4	6
	9	11 Problem Set I	13
	16	18 Problem Set II	20
	23	25 Problem Set III	27
Oct	30	2 Problem Set IV	4
	7	9 Midterm I	11
	14 no class	16 Problem Set VI	18
	21	23 Problem Set VII	25
Nov	28	30 Problem Set VIII	1
	4	6 Midterm II	8
	11 no class	13 Problem Set X	15
	18	20 Problem Set XI	22
	25	27	29