Math 120

Honours Differential Calculus

INSTRUCTOR INFORMATION

Instructor: Ozgur Yilmaz
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Office: Math Annex 1113
Hours: Monday 11 am - 12 noon or by appointment
Phone: 822-5963

COURSE INFORMATION

Section: 101

Class times and location:

Day	Start Time	End Time	Building	Room
Mon Wed Fri	10:00	11:00	Buchanan	A202
Tue	10:00	11:00	Math	203

Course web page: http://www.math.ubc.ca/~oyilmaz/courses/m120/m120.html

Text: Robert A. Adams and Christopher Essex, *Calculus: Single Variable*, 8th edition

Basic information: Math 120 is the honours version of Math 100, covering mostly the same topics, but in greater foundational depth and with emphasis on solving difficult and/or theoretical problems rather than just routine exercises.

Prerequisites: 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; or (d) permission from Mathematics Department Head.

Material: Below numbering refers to Adams and Essex, 8th edition.

1. **Review** (1 week): functions, graphs, absolute values, inequalities etc. (P.1, P.4, P.5)
2. **Limits** (1.5 weeks): limits of sequences and functions, limit laws, continuity, Intermediate Value Theorem. (9.1, 1.2-1.5)
3. **Derivatives** (3.5 weeks): tangents and differentiability, higher derivatives, differentiation rules (including chain rule), implicit differentiation, Mean Value Theorem. (2.1-2.8, 2.10-2.11)
4. **Elementary Functions** (3 weeks)**:** inverse functions and their derivatives, exponential and logarithmic functions and their derivatives, exponential growth and decay, derivatives of trig and inverse trig functions, implicit differentiation. (3.1-3.5, 2.9)
5. **Applications** (2 weeks): Newton's method, l'Hôpital's Rule, curve sketching, maximum and minimum problems, related rate problems. (4.1-4.8)
6. **Approximation** (2 weeks): linearization (with error estimate), quadratic and higher approximations, Taylor polynomials and Taylor's theorem with Lagrange remainder, Taylor series for exp, sin, cos. (4.9-4.11)

If you need help, or would like to discuss any aspect of this course, please make an appointment to see me in my office.

Grades

Your grade for the course will be computed roughly as follows:

Homework: 10%
Two midterms: 20% each
Final: 50%

There will be **two midterm** exams, held in class:
Midterm 1: Wednesday, October 9
Midterm 2: Wednesday, November 13

The midterm and final exams will be closed book. No formula sheets or calculators will be allowed.

Missing a midterm normally results in a mark of 0. Exceptions may be granted in two cases: prior consent of the instructor or a medical emergency. In the latter case, the instructor must be notified within 48 hours of the missed test, and presented with a doctor's note immediately upon the student's return to UBC. In such cases, there will be no make-up exam. Instead, the final exam mark will be adjusted to make up for the missed midterm mark.

Homework Assignments

There will be homework collected every week (which will be posted on this web site). Late homework will not be accepted. The lowest homework grade will be dropped.

Homework 1 (due Tue, Sep 10)	Problems	Solutions

CALENDAR

Tue, Sep 3	Term starts -- Imagine UBC Day (**no class**)
Wed, Sep 18	**No class** (TRC National Event)
Wed, Oct 9	**Midterm 1**
Mon, Oct 14	Thanksgiving (university is closed)
Mon, Nov 11	Remembrance Day (university is closed)
Wed, Nov 13	**Midterm 2**
Fri, Nov 29	Last day of classes
TBA	Final Exam