

MATH 103 Course Outline 16W Term 2

Integral Calculus with Applications

to Life Sciences

January – April 2017

Course Overview

This course in integral calculus complements technical content with **applications** and examples drawn primarily from life sciences. The course starts by calculating areas and approximating the area using thin stripes as an introduction to Riemannian sums, which then lead to the *Fundamental Theorem of Calculus*. Applications of integration include determining the center of mass, calculating volumes and lengths of curves. After introducing different techniques of integration further applications are discussed in the context of continuous probability distributions as well as differential equations. After an exploration of series and sequences the course ends with an introduction to Taylor polynomials.

Prerequisite

One of MATH 100, MATH 102, MATH 104, MATH 110, MATH 111, MATH 120, MATH 180, MATH 184.

Instructors

[Section 201](#): Christoph Hauert

[Section 202](#): Saikat Mazumdar

[Section 203](#): Christoph Hauert

[Section 206](#): Dijana Kreso

[Section 207](#): Martin Lohmann

[Section 208](#): Samatha Dahlberg

[Section 209](#): Samatha Dahlberg

[Section 212](#): Nate Bade

Course Notes

The [course notes](#) by Prof. Leah Keshet. Either download as you wish for free or purchase a bound version at [copiesmart](#)

Course Schedule

Week	Topic	Notes
Jan. 3-6	Areas and simple sums	
Jan. 9-13	Areas and Riemannian sums	
Jan. 16-20	The Fundamental Theorem of Calculus	
Jan. 23-27	Applications of the definite integral	
Jan. 30 - Feb. 3	Volumes and Length	
Feb. 6-10	Techniques of Integration	
Feb. 13-17	Techniques of Integration, Improper Integrals	Family day
Feb. 20-24		Midterm break
Feb. 27 - March 3	Continuous probability distributions	
March 6-10	Differential Equations	
March 13-17	Sequences	
March 20-24	Series	
March 27-31	Series, Taylor polynomials	
April 3-6	Taylor Polynomials, Review	

Topics & Learning Goals

Please check out the comprehensive [syllabus](#) of the course:
<http://www.ugrad.math.ubc.ca/coursedoc/math103/2016w2/syllabus.pdf>

Grading Scheme

For excellent background information on grading at the university level see the [perspectives](#) provided by Prof. Mark McLean.

Final Exam	50%
Midterm 1	15%
Midterm 2	15%
WeBWorK	13%
OSH	7%

Note: In order to pass the course a minimum mark of 40% on the final exam is required and you must pass ($\geq 50\%$) at least on one of the two midterms or the final exam.

Note: For your WeBWorK portion, at the end of term only the top 95% of all problems count towards your final grade. For example, if you solve 95 out of 100 problems correctly, you will receive a perfect grade on the WeBWorK portion.

Regrading Policy

All instructors have decided to adopt the following policy for regrading examinations/assignments:

Please indicate which problems you would like to have regraded and why on a sticky note/stapled piece of paper attached to the homework or midterm in question. Your instructor will have a look at the question in doubt but will also look at **all other questions** as well. This means that your mark could *decrease* after regrading. However, if the error in question is simply a mistake in adding the marks, then it will be corrected without remarking any questions. Papers for regrading will be accepted no earlier than **24 hours** after solutions have been posted and no later than **10 days** afterwards.

Exam regulations

- For a full description of the final exam regulations, see the UBC Calendar page on [Student Conduct during Examinations](#). This includes use of cell phones for checking the time. The same regulations apply for the midterms.
- If you are unable to attend one of the midterms, you must notify your instructor at the beginning of term with a legitimate reason (usually restricted to conflicts with other UBC classes) or provide professional documentation of any medical emergency etc. within two days of the exam date. In either of these two cases (and only in these two cases), suitable accommodations will be made. Generally, your other midterm and final exam grade will be scaled accordingly. Undocumented absences from midterms will result in a score of zero.
- Student ID's are required and will be checked on midterms as well as the final exam.
- Calculators, cell phones and other electronic devices are strictly prohibited from use during the midterms and the final exam.
- A [formula sheet](#) will be provided on midterms as well as the final exam.