MATH*1200

Calculus I

Fall 2016

(Revision 1: September 21, 2016)

1 Instructional Support

1.1 Instructors

Matthew Demers, Ph.D.

Office: RICHS 2523, ext. 56933
Email: mdemers@uoguelph.ca
Office hours: Thursday 2:30pm-4:00pm in THRN*1425

Kimberly M. Herder, Ph.D.
Office: RICHS 2525, ext. 52875
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Office hours: Tuesday 3:00pm-4:00pm in THRN*1425
Friday 10:30am-11:30am in THRN*1425

Due to large class size, office hours are held in a group setting. We have found this to be a very productive and supportive learning environment in the past. Should you require an individual, private appointment with either of us, please contact us by email to set up a meeting.

1.2 Teaching Assistants

Joseph Reilly Comper	Kamal Jnawali
Brian Corbett	Spencer Kirbyson
Brady Dortmans	Duncan Mackinnon
Harry Gaebler	Shayan-Shawn Majidy
Michael Griffiths	Yousef Rohanizadegan
Thulasi Jegathessan	Richard Yam

2 LEARNING RESOURCES

2.1 Course Website

Course material, news, announcements, and grades will be regularly posted to the MATH*1200 Courselink website. You are responsible for keeping up-to-date on this site.

2.2 Required Resources

M. Demers and K. Herder (Levere), *MATH*1200 – Calculus I Course Manual*, available at the MacNaughton Bookstore.

- This is the primary resource for this course and functions both as a textbook, and as a notebook that we will complete together in class as the course progresses. Please be sure that you have the current version (only available at the MacNaughton Bookstore) as a number of changes have been made to last year's manual.

2.3 Recommended Resources

Not applicable.

2.4 Additional Resources

Past tests, supplementary questions, and other resources may be posted on the Course website as needed. Again, it is important that you check regularly to keep up-to-date.

Lecture Information:

Completed lecture notes will be uploaded to the Course website at the end of every week. This is not a substitute for lecture attendance! We strongly recommend that you attend every class.

Lab Tutorial Information: A weekly lab session will give you the opportunity to tackle tougher problems or extra practice questions. We may also use this time to cover course material directly from the Course Manual. It is your responsibility to obtain completed notes from lab tutorials if you cannot attend as **these will *not* be posted online** unless otherwise specified.

Each week you will have the opportunity to participate in a vote to choose a "We're All In This Together" (or WAITT) problem for each lab. These are problems that are often asked in office hours that we feel everyone might benefit from seeing together as a group! Be a part of the vote!

Online Quizzes: We will be using the Courselink quizzing system for this course. There will be two quizzes each worth 5% (due dates are posted in Section 3 of this outline). In order to give you lots of practice, each quiz will have three versions (each version may be attempted only once). Your grade for the overall quiz will be the highest grade that you achieve on any version.

2.5 Communication & Email Policy

Please use office hours and Courselink discussion forums as your main opportunity to ask questions about the course. Major announcements will be posted to the course website. **It is your responsibility to check the course website regularly.** As per university regulations, all students are required to check their <mail.uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its student.

3 ASSESSMENT

3.1 Dates and Distribution

Your grade will be determined using the more favourable of the two grading schemes:

Grading Scheme 1	Grading Scheme 2
Online Quizzes 10% **	Online Quizzes 10% **
Warm-up Test 10%	Warm-up Test 0%
Term Test 1 20%	Term Test 1 20%
Term Test 2 20%	Term Test 2 20%
Final Exam 40%	Final Exam 50%

**You must receive at least 50% of the marks available, in total, on the warm-up test, tests, and final exam that are used to calculate your final grade. That is,

(Total marks earned on all tests and exam) ÷ (Total marks available on all tests and exam) ≥ 50%

If you do not achieve this, your maximum possible final grade will be 48%, *no matter what grade you receive on the Online Quiz component*. Provided that you satisfy the above equation, your final grade will be calculated using the more favourable of the above two grading schemes. Considerations may be made according to the policies listed in Section 3.2.

Online Quizzes: There will be 2 Courselink quizzes for you to complete, each worth 5%.

Quiz 1 (Differentiation) will be due Thursday, November 10th at 11:59pm
Quiz 2 (Integration) will be due Thursday, November 24th at 11:59pm

Each quiz will have three versions, each of which you may attempt only once. Your grade for each quiz will be equal to the highest grade received from all versions that you complete.

Quizzes will be available to you at least 3 days in advance of their due date to give you ample time to complete them.

Warm-up Test: Friday, September 16th, 2016, 12:30pm-1:20pm
(40 minutes to write, excess in case of delay)
Locations: Your scheduled lab location:
WMEM*103 or ROZH*104.

Term Test 1: Saturday, October 15th, 2016, 9:30am-11:00am
(1 hour to write, excess in case of delay)
Locations: Last Names A- I report to ROZH*101
Last Names J- Z report to ROZH*104

Term Test 2: Saturday, November 19th, 2016, 9:30am-11:00am
(1 hour to write, excess in case of delay)
Locations: Last Names A- I report to ROZH*101
Last Names J- Z report to ROZH*104

Final Exam: Thursday, December 8th, 2016, 2:30pm-4:30pm
(2 hours to write)
Locations: TBA on Courselink and in class.

3.2 Course Grading Policies

Academic Consideration: When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, ID number, and e-mail contact. See the academic calendar for information on regulations and procedures for Academic Consideration: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Accommodation of Religious Obligations: If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor at the start of the semester to make alternate arrangements. See the undergraduate calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml

Missed midterm tests: Missed test and/or miniquizzes will receive a grade of 0%, unless they are missed due to any of the above reasons, in which case the weight of the missed test or miniquiz will be added to the final exam. There will be no makeup tests or miniquizzes.

Passing grade: In order to pass the course, you must receive a final grade of at least **50%**. Additionally, in order to pass this course, you must receive at least 50% of the marks available, in total, on the warm-up test, tests and final exam that are used to calculate your final grade. If you do not achieve this, your maximum possible final grade will be 48%.

Group Work: While you are encouraged to work together to learn the course material and complete For You to Try exercises, all online quizzes must be completed individually. It is academic misconduct to complete another student's quizzes. Please see section 6 of this outline for further details on academic misconduct.

4 AIMS, OBJECTIVES & GRADUATE ATTRIBUTES

4.1 Calendar Description

This is a theoretical course intended primarily for students who expect to pursue further studies in mathematics and its applications. Topics include inequalities and absolute value; compound angle formulas for trigonometric functions; limits and continuity using rigorous definitions; the derivative and derivative formulas (including derivatives of trigonometric, exponential and logarithmic functions); Fermat's theorem; Rolle's theorem; the mean value theorem; applications of the derivative; Riemann sums; the definite integral; the fundamental theorem of Calculus; applications of the definite integral; the mean value theorem for integrals.

Credit Weight: 0.5 **Department:** Mathematics & Statistics **Campus:** Guelph

Prerequisite: 1 of 4U Calculus and Vectors, 4U Advanced Functions and Calculus or Grade 12 Calculus

4.2 Course Aims

This course is an introductory course in Calculus. The objective of the course is to give you a strong mathematical background that you will require as you progress through your degree. The main goals of the course are (1) to teach students the Calculus concepts listed in section 4.1 at a level that promotes a deep understanding and (2) to explain how such concepts are applicable in their various degrees by exploring real-world problems.

4.3 Learning Objectives

At the successful completion of this course, the student will have demonstrated the ability to:

1. Evaluate, graph and know the properties of a variety of functions, including trigonometric, logarithmic, and exponential functions.
2. Establish a set of techniques for solving inequalities (perhaps involving absolute value).
3. Establish a set of techniques for treating a wide variety of limits including basic limits and indeterminate forms. Have an understanding of what a limit is calculating.
4. Prove limits using a delta-epsilon definition.
5. Understand what the derivative of a function is and how to calculate it using basic formulas, or the first-principles definition of the derivative.
6. Apply theoretical results in mathematical reasoning.
7. Calculate antiderivatives (definite and indefinite) of basic, through to complicated functions and compositions of functions.
8. Understand the Riemann sum and how it motivates the definite integral.
9. Calculate the area under a curve or between several curves.

10. Solve word problems by applying formulas and techniques learned in class.
11. Identify inadmissible solutions that arise mathematically, but are not logical possibilities in a given problem.
12. Think critically about complicated mathematical problems. Question the potential subtleties of such problems and give a complete and correct answer.

4.4 Graduate Attributes

Successfully completing this course will contribute to the following CEAB Graduate Attributes:

Graduate Attribute	Learning Objectives	Assessment
1. Knowledge Base for Engineering	1-12	Quizzes, Exams, Labs
2. Problem Analysis	1-12	Quizzes, Exams, Labs
3. Investigation	1-12	Quizzes, Exams, Labs
4. Design	-	-
5. Use of Engineering Tools	-	-
6. Communication	-	-
7. Individual and Teamwork	1-12	Labs
8. Professionalism	-	-
9. Impact of Engineering on Society and the Environment	-	-
10. Ethics and Equity	-	-
11. Environment, Society, Business, & Project Management	-	-
12. Life-Long Learning	-	-

4.5 Instructor's Role and Responsibility to Students

As your instructor, I must:

1. Develop and deliver course material in a professional way that facilitates learning for a variety of students and learning styles;
2. Attend all lectures, filling in the course notes as we proceed in each lecture. We will provide completed course notes online regularly, but we strongly urge you to come to class. Bear in mind that most Tutorials will not use the Course Manual and these completed notes might not be provided to you.
3. Respond to you. This includes, as time permits, questions in lectures, after classes, during office hours, or through email (where we reserve the right to reply within a timeframe of 1-2 days). You are more than welcome to contact us at any time through these means if you have questions or concerns about the course or the course material.
4. Evaluate you fairly, and fairly as compared to your peers, providing prompt feedback on your performance and justification for your grade. We must provide academic consideration, where appropriate, as described in Section 3.

4.6 Students' Learning Responsibilities

As a member of this class, you are expected to:

1. Take advantage of the learning opportunities provided during lectures and in tutorials.
2. Treat others with respect and dignity whenever you address them, in-class or online.
3. Genuinely attempt all homework in a timely manner, including the online miniquizzes and the "For You to Try" component of the Course Manual, on your own time.
4. Seek help if you have tried the homework and are still having difficulty with the course content. This means contacting us (*not* just at the last minute!) and possibly considering other resources as we recommend them to you;
5. Check all grades against tests that have been returned to you, once they are posted to the Course website, to verify that the correct mark has been recorded.
6. Notify us, as described in Section 3, in the case that there are missed tests or academic conflicts that are known in advance. If illness, work, or extra-curricular activities are causing you to struggle, you are advised to keep us up-to-date on your progress, so that we can be more helpful to you.

5 TEACHING AND LEARNING ACTIVITIES

5.1 Timetable

Lectures (Section 01 - Dr. Herder (Levere)):

Tuesday	5:30 pm – 6:50 pm	WMEM*103
Thursday	5:30 pm – 6:50 pm	WMEM*103

Lectures (Section 02 - Dr. Demers):

Monday	2:30 pm – 3:20 pm	ROZH*101
Wednesday	2:30 pm – 3:20 pm	ROZH*101
Friday	2:30 pm – 3:20 pm	ROZH*101

Tutorials:

Friday	12:30 pm – 1:20 pm	ROZH*104
Friday	12:30 pm – 1:20 pm	WMEM*103

5.2 Lecture Schedule

(schedule is approximate and subject to change depending on time constraints)

Lectures (Week)	Lecture Topics	References
Self-study	Review of Functions – basic functions, trigonometric functions, exponential and logarithmic functions.	Chapter 1
1	Piecewse functions, the absolute value function, and inequalities.	Chapter 2
2	Limits & Continuity	Chapter 3
3	The Formal Definition of a Limit	Chapter 4
4	Continuity Theorems	Chapter 5
5	Derivatives	Chapter 6
6	Implicit Derivatives & Applications	Chapter 7
7	Derivative Theory	Chapter 8
8	Applications of Differentiation	Chapter 9
9	Antiderivatives	Chapter 10
10-11	Riemann Sums and Definite Integrals	Chapter 11
12	Applications of Integration	Chapter 12

5.3 Lab Schedule

Lab topics will correspond to weekly topics. Together we will practice the material covered in class as well as extend it to more interesting problems.

5.4 Other Important Dates

First day of classes: Thursday, September 8, 2016
Thanksgiving: Monday, October 10th, 2016 (no classes)
Fall Study Break Day: Tuesday, October 11th, 2016 (no classes)
Thursday, December 1, 2016 (runs as a TUESDAY in lieu of Fall Study Break Day)
Friday, December 2, 2016 (runs as a MONDAY in lieu of Thanksgiving)
Last day of classes: Friday, December 2nd, 2016.

Drop Date: The last date to drop one-semester courses, without academic penalty, is Friday, November 4th, 2016. Two-semester courses must be dropped by the last day of the add period in the second semester. Refer to the Graduate Calendar for the schedule of dates: http://www.uoguelph.ca/registrar/calendars/graduate/current/sched/sched-dates-f10.shtml

Course Evaluation Information: Near the end of the term, you will be given the opportunity to evaluate your instructor and provide comments regarding your experience. The evaluations for this class will be done in-class. Your instructor will inform you of when these are to take place.

6 Lab Safety

Safety is critically important to the School and is the responsibility of all members of the School: faculty, staff and students. As a student in a lab course you are responsible for taking all reasonable safety precautions and following the lab safety rules specific to the lab you are working in. In addition, you are responsible for reporting all safety issues to the laboratory supervisor, GTA or faculty responsible.

7 Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.
Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member.

7.1 Resources

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

A tutorial on Academic Misconduct produced by the Learning Commons can be found at:
http://www.academicintegrity.uoguelph.ca/

Please also review the section on Academic Misconduct in your Engineering Program Guide.

The School of Engineering has adopted a Code of Ethics that can be found at:
http://www.uoguelph.ca/engineering/undergrad-counselling-ethics

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8 ACCESSIBILITY

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability for a short-term disability should contact Student Accessibility Services, SAS, (formerly, the Centre for Students with Disabilities) as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website: http://www.csd.uoguelph.ca/csd/

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9 RECORDING OF MATERIALS

Presentations which are made in relation of course work – including lectures – cannot be recorded or copied without the permission of the presenter, whether the instructor, classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

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10 RESOURCES

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.
http://www.uoguelph.ca/registrar/calendars/index.cfm?index