MATH*1210 Calculus II

Winter 2019

UNIVERSITY of GUELPH

(Revision 0: December 18, 2018)

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1 INSTRUCTIONAL SUPPORT

1.1 Instructor

Dr. Matthew Demers

Office: MacN 543, ext. 53079
Email: mdemers@uoguelph.ca
Office hours:

1.2 Teaching Assistants

Ningping Cao	Zainab (Momina) Dar
Eric Fernandes	Harry Gaebler
Liam Graham	Connor Gregor
Thulasi Jegatheesan	Braden Kelly
Myles Nahirmiak	Phuc Ngo
Danielle St. Jean	Lucy Tran

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2 LEARNING RESOURCES

2.1 Course Website

Various announcements, resources, completed notes, and grades will be regularly posted to the Courselink site. Please be sure to visit it every day to keep up-to-date!

2.2   Required Resources

M. Demers and K. Levere, *MATH*1210 – Calculus II Course Manual*, available at the MacNaughton Book Store. This is the primary resource for the course and functions both as the 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, the 6th edition, only available in the MacNaughton bookstore.

2.3   Recommended Resources   (Not Applicable)

2.4   Additional Resources

Lecture Information: Completed lecture notes will be uploaded to the Course website at the end of every week. It is, however, strongly recommended 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.

Other: Past tests, completed notes, and other resources may be posted to Courselink as needed. Again, it is important that you check regularly to keep up-to-date.

2.5   Communication & Email Policy

Please use lectures and lab help sessions 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.

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3   ASSESSMENT

3.1   Dates and Distribution

Warmup Test:
Friday, January 18th (40 minutes to write).
The Warmup Test will be held *at the time and location of your usual lecture.*

The Warmup Test is a unique test that is designed to check your readiness for the course. Preparing for the Warmup will give you a chance to review necessary concepts well before we need them in class, so that I know that you're ready for what's coming! Topics will be varied, but focusing on basic arithmetic, functions, and first-semester calculus. (More details to come in class and on Courselink!)

Test 1:
Friday, February 1st, 6:00 pm – 7:30 pm (90 minutes to write)
Location To Be Announced

Test 1 will focus on the first few weeks of material from the course. More details will be provided as we get closer to the big day!

Test 2:
Friday, March 15th, 6:00 pm – 7:30 pm (90 minutes to write)
Location To Be Announced

Test 2 features some of the most important material in the course and will be worth a greater proportion of your grade. Test 2 may feature concepts introduced and tested during Test 1; however, it will not be cumulative in the sense that there will not be any questions that focus **squarely** on Test 1 material.

Online Quizzes:
Several online quizzes will become available as the course progresses. These are meant as a simple way to introduce yourself to new concepts, but they DO NOT serve as a replacement for lab or "For You to Try" questions. You may try the quizzes as many times as you wish before they are due, and only your best grade will be recorded. Any quizzes that are open will always close on a Thursday night at 11:59 pm. Thus, make sure you remain aware of any currently-open quizzes as we go.

Final Exam:
Wednesday, April 10th, 11:30 am – 1:30 pm
Location To Be Announced

The Final Exam *will be cumulative*, but will be more heavily focused on those materials that have not yet been tested. The Final Exam is a good place for me to test to see if you can make connections between different concepts throughout the course in creative ways, so be ready to extend your knowledge!

Your grade will be calculated in the following way:
Test 1 is worth **15%** of your mark.
Test 2 is worth **25%** of your mark.
The Online Quizzes are worth **10%** of your mark.
The Warmup Test is worth **10%** of your mark; *OR* **0%** if your Final Exam grade is better.
The Final Exam is worth **40%** of your mark, *OR* **50%** if you perform better than on your Warmup test, *PLUS* any portion of the Online Quiz mark that you did not earn throughout the course.

Example One:
Danielle earns a grade of 65% on her Warmup Test, a 78% on the Final Exam, and 8.4/10 for her online quizzes. Therefore, her final exam is worth 50 + 1.6 = 51.6%.

Example Two:
Ahmed obtains a 90% on his Warmup Test, a 55% on the Final Exam, and does not do a single online quiz throughout the semester. Therefore, his final exam is worth 40 + 10 = 50% of his final grade.

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 tests will receive a grade of 0%, unless you miss a test due to any of the above reasons, in which case the weight of the missed test will be added to the final exam. There will be no makeup tests.

Passing grade:
In order to pass the course, you must receive a final grade of at least **50%**. Additionally, as a minimum requirement, you must pass at least one of Test 1, Test 2, or the Final Exam. **If you fail all three of these, your mark will be capped at 48%, no matter how well you do on the Warmup Test and the Online Quizzes.**

Group Work:
You are encouraged to work together to learn the course material and complete For You to Try exercises. Nevertheless, be sure to use this as an opportunity for you to further your OWN understanding and ability to solve problems independently!

4 Aims, Objectives & Graduate Attributes

4.1 Calendar Description

This course is a continuation of MATH*1200. It is a theoretical course intended primarily for students who need or expect to pursue further studies in mathematics, physics, chemistry, engineering and computer science. Topics include inverse functions, inverse trigonometric functions, hyperbolic functions, indeterminate forms and l'Hopital's rule, techniques of integration, parametric equations, polar coordinates, Taylor and Maclaurin series; functions of two or more variables, partial derivatives, and if time permits, an introduction to multiple integration.

Credit Weight: 0.5 Department: Mathematics & Statistics   **Campus**: Guelph
Prerequisite: One of MATH*1000, MATH*1080, or MATH*1200
Restrictions: MATH*2080

4.2 Course Aims

This course extends the ideas and concepts covered in a first Calculus course. The objective of the course is to broaden your mathematical background to explore more advanced topics. 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, a student will have demonstrated the ability to:

1. Understand fundamentals of complex numbers in various forms.

2. Work with inverse functions (including inverse trig), domains, ranges, and graphs.

3. Define and graph hyperbolic functions and their inverses.

4. Identify indeterminate forms and effectively use L'Hopital's rule to evaluate limits.

5. Utilize various advanced integration techniques to find antiderivatives.

6. Evaluate improper integrals.

7. Calculate volumes of revolution using definite integrals.

8. Calculate the arclength of a curve using integral formulas.

9. Work with parametric curves and polar coordinates.

10. Derive Taylor and MacLaurin series for a variety of functions.

11. Extend concepts to multivariable functions, including partial derivatives.

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	1-10	Exams, Labs
2. Problem Analysis	1-10	Exams, Labs
3. Investigation	1-10	
4. Design	-	-
5. Use of Engineering Tools	-	-
6. Communication	-	-
7. Individual and Teamwork	1-10	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 pledge to:

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 Manual 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 and lab tutorials, 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 either of us at any time through these means if you have questions or concerns about the course or the course material.

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, labs, and through Courselink.

2. Treat others with dignity whenever you address them, in-class or online. There are hundreds of people enrolled in this class from all walks of life and of all skill levels. Your understanding and respect of this diversity is extremely important!

3. Genuinely try all homework in a timely manner and make the effort of attempting optional practice questions, especially if you have faced some trouble with math courses in the past.

4. Seek help if you have tried the homework and are still having difficulty with the course content. This means using the Courselink forums to get help from your peers, contacting me through email or in office hours (*not* just at the last minute!) and possibly considering other resources as I recommend them to you.

5. Check all of your posted grades with tests that have been returned to you, to verify that the correct mark has been recorded. If not, then for tests, get in touch with me right away in person or through email, and we will figure things out.

6. Notify me, as described in Section 3, in the case that there are academic conflicts that are known in advance. If illness, work, or extra-curricular activities are causing you to struggle, you are advised to keep me up-to-date on your progress, so that I can be more helpful to you.

5 TEACHING AND LEARNING ACTIVITIES

5.1 Timetable
Lectures are Mondays, Wednesday, and Fridays at:
10:30 – 11:20 am, ROZH 101 (Section 1)
1:30 – 2:20 pm, ROZH 101 (Section 2)

Labs are Fridays at:
8:30 am, War Memorial Hall (Lab Section 1)
4:30 pm, War Memorial Hall (Lab Section 2)

5.2 Lecture Schedule
(Schedule is approximate and subject to change depending on time constraints)

Lectures (Week)	Lecture Topics	References
1	Complex Numbers	Chapter 1
1-2	Inverse Functions	Chapter 1
3	Hyperbolic Functions	Chapter 2
4	L'Hôpital's Rule	Chapter 3

4-5	Advanced Integration Techniques	Chapter 4
6	The Method of Partial Fractions	Chapter 5
6-7	Improper Integrals	Chapter 6
7-8	Volumes of Revolution	Chapter 7
8-9	Arclength of a Curve and Parametric Equations	Chapter 8
10	Polar Coordinates	Chapter 9
11	Taylor & MacLaurin Series	Chapter 10
12	Introduction to Multivariable Functions	Chapter 11

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: Monday, January 7th, 2019
Reading Week: Monday, February 18th, 2019 - Friday, February 22nd, 2018 (no classes)
40th Class Day: Friday, March 8th, 2019
Last day of classes: Friday, April 5th, 2019

Drop Date: Courses that are one semester long must be dropped by the end of the fortieth class day (**Friday, March 8th, 2019**); two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for Dropping Courses are available in the Undergraduate Calendar. https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.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 online, but a designated time will be given to complete these in class.

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

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, CSD) 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