MATH*1210 Calculus II
Winter 2013

UNIVERSITY of GUELPH

(Revision 0: November 27, 2013)

1 INSTRUCTIONAL SUPPORT

1.1 Instructors

Matthew Demers, Ph.D.
Office: RICHS 2523, ext. 56933
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Kimberly M. Levere, Ph.D.
Office: RICHS 2525, ext. 52875

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Office hours: TBA

1.2 Maple TA Support

Gord Clement, M.Sc.
Email: gordclement@gmail.com

2 LEARNING RESOURCES

2.1 Course Website

Course material, news, announcements, and grades will be regularly posted to the MATH*1210 Course site. You are responsible for keeping up-to-date on this site.

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.

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. It is your responsibility to obtain completed notes from lab tutorials if you cannot attend, as these will *not* be posted online unless we otherwise specify.

Online Quizzes: A link to the Maple TA website is available through the Course website. Do not try to find the Maple TA site by doing a web search; you may find the wrong page if you do this. You can login using your Central Student ID and password. If you have any issues at all accessing the online quizzes, please contact support by emailing Gord: gordclement@uoguelph.ca . Be as specific as you can, so that we can more easily be helpful; include your name and student number.

Other: Past tests, supplementary questions, and other resources may be posted to the Course website 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 <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

Quizzes (15%):

January 16:	Miniquizzes 1 & 2 are due at 11:59 pm.
January 23:	Miniquizzes 3 & 4 are due at 11:59 pm.
January 30:	Miniquizzes 5 & 6 are due at 11:59 pm.
February 6:	Miniquizzes 7 & 8 are due at 11:59 pm.
February 13:	Miniquizzes 9 & 10 are due at 11:59 pm.
February 27:	Miniquizzes 11 & 12 are due at 11:59 pm.
March 6:	Miniquizzes 13 & 14 are due at 11:59 pm.
March 13:	Miniquizzes 15 & 16 are due at 11:59 pm.
March 20:	Miniquizzes 17 & 18 are due at 11:59 pm.
March 27:	Miniquizzes 19 & 20 are due at 11:59 pm.
April 3:	Miniquizzes 21 & 22 are due at 11:59 pm.

You will have 5 attempts to do each miniquiz; your grade for each miniquiz will be equal to the highest grade received from all attempts you have taken at that miniquiz.

Test 1 (15%): Friday, January 31, 5:30 pm – 6:45 pm

Location: TBA

Test 2 (15%): Friday, February 28, 5:30 pm – 6:45 pm

Location: TBA

Test 3 (15%): Friday, March 21, 5:30 pm – 6:45 pm

Location: TBA

Final Exam (40%): Date: TBA

The location of the Final Exam will be announced in class and on the Course website.

Your final grade is calculated using the Miniquizzes, Tests, and Final Exam, weighted as listed; however, considerations may be made according to policies listed in Section 3.2.

3.2 Course Grading Policies

Missed Assessments: If you are unable to meet an in-course requirement due to medical, psychological, or compassionate reasons, you must contact your course instructor. See the undergraduate 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. Missed miniquizzes will receive a grade of **0%**, and there will be no makeup miniquizzes.

Passing grade: In order to pass the course, you must receive a final grade of at least **50%**.

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.

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, the student will have demonstrated the ability to:

1. Understand the notion of an inverse function, how to calculate them and determine when they exist. Define inverse trigonometric functions and understand how their domain and range affects how they are evaluated.

2. Define and graph inverse trigonometric functions. Evaluate expressions involving inverse trigonometric functions, find and derive their derivatives and antiderivatives.

3. Define and graph hyperbolic functions and their inverses. Calculate their derivatives and antiderivatives.

4. Understand L'Hôpital's rule and prove this result. Understand, identify and manipulate indeterminate forms.

5. Understand and derive the technique of integration by parts. Evaluate a variety of integrals using this technique.

6. Evaluate antiderivatives of a multiplication of trigonometric functions using trigonometric identities. Identify and understand which method to apply in what instance.

7. Evaluate and understand the technique of trigonometric substitution. Use this technique to solve a variety of antiderivatives and be able to identify which substitution to use in what instance.

8. Evaluate antiderivatives using partial fractions or the Heaviside cover-up method. Know the different cases and how to proceed in each.

9. Understand and evaluate improper integrals and how they differ from the integrals studied thus far.

10. Find the volumes of various solids using definite integrals and volumes of revolution.

11. Derive and evaluate the arclength of a curve. Understand, derive and graph parametric equations. Find derivatives and the arclength of parametric equations.

12. Derive, and graph polar equations. Understand how to convert from rectangular coordinates to polar coordinate and vice versa.

13. Evaluate Taylor and MacLaurin series for a variety of functions. Use Calculus techniques to find the Taylor or MacLaurin series of more advanced functions. Understand summation notation.

14. Understand the notion of a multivariable function, graph level curves, find partial derivatives and compute basic antiderivatives.

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	1-14	Quizzes, Exams, Labs
2. Problem Analysis	1-14	Quizzes, Exams, Labs
3. Investigation	1-14	Quizzes, Exams, Labs
4. Design	-	-
5. Use of Engineering Tools	-	-
6. Communication	-	-

7. Individual and Teamwork	1-14	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 Respnsibility to Students

As your instructors, we 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 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. 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 tutorials;

2. Treat others with respect and dignity whenever you address them, in-class or online.

3. Genuinely try 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.

4.7   Relationships with other Courses & Labs

Previous Courses:

   MATH*1000, MATH*1080, or MATH*1200

Follow-on Courses:

   ENGG*1210: Mechanical system fundamentals such as force, torques, friction, moments, free body diagrams.

   ENGG*1500: Solving systems of linear equations, matrix algebra, complex numbers.

   MATH*2270: Solving differential equations.

   MATH*2130: Methods for solving a variety of problems numerically.

   ENGG*2XXX: A number of second year courses will use the material covered in MATH*1210.

   ENGG*3XXX: A number of third year courses will use the material covered in MATH*1210.

5   TEACHING AND LEARNING ACTIVITIES

5.1   Timetable

Lectures (Section 01 – Dr. Demers):

Monday	11:30 pm – 12:20 pm	WMEM
Wednesday	11:30 pm – 12:20 pm	WMEM
Friday	11:30 pm – 12:20 pm	WMEM

Lectures (Section 02 – Dr. Levere):

Tuesday	4:00 am – 5:20 am	ALEX*200
Thursday	4:00 am – 5:20 am	ALEX*200

Tutorials:

Friday	8:30 pm – 9:20 pm	ROZH*101
Friday	8:30 pm – 9:20 pm	ROZH*104

5.2 Lecture Schedule

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

Lectures (Week)	Lecture Topics	References	Learning Objectives
1	Inverse Functions	Chapter 1	1,2
2	Hyperbolic Functions	Chapter 2	3
3	L'Hôpital's Rule	Chapter 3	4
4-5	Advanced Integration Techniques	Chapter 4	5,6,7
6	The Method of Partial Fractions	Chapter 5	8
7	Improper Integrals	Chapter 6	9
8	Volumes of Revolution	Chapter 7	10
9-10	Arclength of a Curve and Parametric Equations	Chapter 8	11
10-11	Polar Coordinates	Chapter 9	12
11-12	Taylor & MacLaurin Series	Chapter 10	13
12	Introduction to Multivariable Functions	Chapter 11	14

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 6th, 2014.

Winter Break: Monday, February 17 – Friday February 21, 2014.

Last day of classes: Friday, April 4, 2014.

Drop Date: The last date to drop one-semester courses, without academic penalty, is Friday, March 7th 2014. 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

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

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 the Centre for Students with Disabilities as soon as possible

For more information, contact CSD 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.

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