Course Outline

MATH 1210
Calculus I for Engineers

Instructor: Grazia Viola
Office: A125A
Email: mviola@lakeheadu.ca
Office Hours: Tuesday 3:00-4:00, Thursday 3:00-4:00, or by appointment

Course Learning Outcomes: By the end of this course, successful students should be able to:

- Understand function and be able to manipulate them.
- Understand and be able to compute limits.
- Compute derivative of functions
- Graph functions.
- Model problems using functions.
- Solve optimization problems.

Class Schedule: Lecture on Tuesdays and Thursdays 1:00-2:30 in A247.
Lab on Friday 9:00-10:00 in A247.

No classes on: Monday, September 4, 2017 (Labour Day – campus closed)
Tuesday, September 5, 2017 (Orientation)
Monday, October 9, 2017 (Thanksgiving – campus closed)
Monday, October 23 to Friday, October 27, 2017 (Study Week)

Exam Period runs Saturday, December 9, 2017 to Sunday December 17, 2017 with Monday December 18, 2017 as a contingency day.

Textbook: Calculus-Early Transcendental Functions (6th Edition), by Ron Larson and Bruce Edwards, Brooks/ Cole.

Course Learning Outcomes: By the end of this course, successful students should be able to:

- Understand function and be able to manipulate them.
- Understand and be able to compute limits.
- Compute derivative of functions
- Graph functions.
- Model real word problems using functions.
- Solve optimization problems.
- Be able to apply the techniques learned in class to solve problem in physics, electric circuits, chemistry, engineerings.

Course Outline: This course has a pre-requisite of MATH 1077 or MHF4U

- **Functions (Chapter 1):}** graphs and models, linear models and rates of change, functions and their graphs, inverse functions, exponential functions, logarithms.
- **Limits and their properties (Chapter 2):** finding limits of functions graphically and

algebraically, continuity and one sided limits, infinite limits.

- **Derivative (Chapter 3):** the derivatives and the tangent line, basic rules of differentiation, the product rule and the quotient rule, the chain rule, higher order derivatives, implicit differentiation, derivatives of inverse functions, related rates, Newton's method.
- **Applications of Differentiation (Chapter 4):** Extrema on an interval. Rolle"s Theorem and the Mean Value Theorem. increasing and decreasing functions and the first derivative test, concavity and the second derivative test. limits at infinity, curve sketching. optimization problems.
- **Integration (Chapter 5, up to section 5.5)** Antiderivatives and indefinite integration. area. Riemann sums and definite integrals. the Fundamental Theorem of Calculus, basic rules of integration, integration by substitution.

Evaluation: The final grade will be determined by two midterms, the homework and the final. The weight of each component is as it follows

- Homework Grade 20%
- Midterm I 20%
- Midterm II 20%
- Final 40%

Exam Schedule: The first midterm will be on October 5, 2017, while the second midterm will be on November 14, 2017. Each midterm will be 75 minutes. The date of the final exam will be announced when the exam schedule becomes available.

Homework: Every week I will send a list of homework problems to work as a practice.. A homework assignment will be due in class on Monday. No late homework will be accepted except with a well documented valid university excuse. IF YOU WORK ALL THE ASSIGNED HOMEWORK PROBLEMS, YOU SHOULD DO WELL IN THE COURSE. WITHOUT PRACTICING THE MATERIAL COVERED IN CLASS IT WILL BE VERY UNLIKELY THAT YOU WILL RECEIVE A GOOD GRADE. Lastly, I will drop one homework grade (the lowest) when determining your homework grade for the semester.

Lab: There is a lab associated with this class. Lab time will be used in multiple ways: to go over more examples, to answer homework questions, and as a problem session. In the problem sessions we will strive to deepen your knowledge of the subject by working on more difficult problems, integrating more than one concept, or working on more open ended problems to facilitate discussion of calculus concepts.

Reading: You should read the material that will be covered in class before coming to class so that you know in advance which points are more obscure for you and you can ask questions in class.

Calculator: Calculator are not allowed during the test. You can use a calculator when you do the homework.

Class policy: You should attend both the lecture and the lab if you want to do well in the class. Cell phones should be turned off during class.

Expectations for Successful completion of the course:

- Attend every class and lab (and if you cannot, ask a learning partner to help you catch up). **Cell phones should be turned off during class.**
- Ask questions if you need clarification (in class or by email).
- Keep up with your course work. Read the designated material and complete the assigned homework so that you can come to class prepared to discuss the issues and concepts during class time.
- Submit your assignments by the deadline!

Plagiarism and academic misconduct: Exams and homework assignments must be independent work. Highly similar assignments will be graded at zero, The head of the department and the dean will also be informed of the academic misconduct. Plagiarism is an extremely serious academic offense and carries penalties varying from failure in an assignment to expulsion from the university. Students are encouraged to review **Section IX of the University Regulations** regarding academic misconduct (http://csdc.lakeheadu.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=24&chapterid=6364&loaduseredits=False).

Academic and Student Code of Conduct Policies: Academic and student policies and procedures for those enrolled in the Lakehead-Georgian programs can be found on the Lakehead-Georgian D2L.
All Lakehead-Georgian programs will follow the Lakehead Regulations as list in the Lakehead University Academic Calendar (http://csdc.lakeheadu.ca/Catalog/ViewCatalog.aspx? pageid=viewcatalog&catalogid=24&chapterid=6347&loaduseredits=False). The University Regulations include but are not limited to Registration, Examinations, Reappraisals and Academic Appeals, Special Examinations, Academic Misconduct, Withdraw, and Timely Feedback. Additional Faculty Regulations may also apply. Please review the Academic Calendar. The Lakehead University Code of Student Behaviour and Disciplinary Procedures as applied to Academic Misconduct will apply to all Lakehead-Georgian students regardless of campus of study (https://www.lakeheadu.ca/faculty-and-staff/policies/student-related/code-of-student-behaviour-and-disciplinary-procedures). The Georgian College Student Code of Conduct will apply to the Lakehead-Georgian students studying at the Barrie campus (http://www.georgiancollege.ca/student-code-of-conduct/).

Student Services and Supports:

Learning Centres:

Our Centres include (drop-in, telephone, skype and 1:1 appointments)

- **Writing Support** (http://library.georgiancollege.ca/writing_centre)
    - Get free help with your writing assignments!
    - Create outlines for assignments and work on sentence structure and paragraph development
    - Access resources to check your references (e.g. APA or MLA)
- **Math Support** (http://library.georgiancollege.ca/math_centre)
    - Get free help with math!
    - Make sense of math questions; Understand word problems; Work with formulae

Peer Tutors: (http://library.georgiancollege.ca/tutoring)

Available to all students to facilitate understanding of course content. To find out more about one-on-one tutors, make an appointment with the Peer Services Advisor.

Accessibility Services: (http://www.georgiancollege.ca/student-life/student-services/accessibility-services/)
If you are a student experiencing a disability who may require academic accommodations and have not yet registered with Accessibility Services, please contact their office at (705) 722-1523 or visit their offices in B110. You must be registered with Accessibility Services to access academic accommodations. Support for those students whose success at college may be affected by a disability include:

- Ongoing support from our Accessibility Advisors including arranging a confidential psycho-educational assessment
- Training in the use of specialized computer technology
- Classroom and test accommodations

This is a general outline. Any communication or change regarding this outline, the time and location of exams as well as other matters concerning the course will be posted on the website and announced in the lecture.