Course Outline

MATH 1171, Calculus I

Instructor: Maria Grazia Viola
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Office Hours: Tuesday 2:30-4:00, Wednesday 2:00-3:20, Thursday 11:45-12:45, or by appointment.

Lectures: Lectures are on Tuesday and Thursday 1:00-2:30 in OA2006.
Lab: Lab is on Friday 9:30-10:30 in OA2017.

Text: Calculus, one and several variables, Tenth edition, by Salas, Hille, Etgen.

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.
  – Learn basic integration rules.
  – Be able to apply the techniques learned in class to solve problem in physics, economics, engineering.

Course Outline:
  – **Precalculus Review (Chapter 1):** functions, domain and range, representation of functions, elementary function (lines, parabolas, trigonometric functions, etc.), piecewise functions, combining functions, composition of functions.
  – **Limits and Continuity (Chapter 2):** intuitive definition of limit, formal definition of limit, one-sided limits, infinite limits, limits laws, continuity, intermediate value theorem, squeeze theorem, trigonometric limits, vertical and horizontal asymptotes.
  – **Derivatives (Chapter 3):** definition of derivatives, rules of derivations, derivatives of higher order, the derivative as rate of change, the chain rule, differentation of trigonometric functions, implicit differentation.
  – **Applications of the First and Second Derivatives (Chapter 4):** the mean value theorem, increasing and decreasing functions, local extrema, extrema value theorem, absolute extrema, optimization problem, concavity and points of inflections, first derivative test, second derivative

test, curve sketching, velocity and acceleration, related rates of change, differentials.

- **Integration (Chapter 5):** the area problem, definite integral of a continuous function, basic rules of integration, the fundamental theorem of calculus, area between two graphs, indefinite integral, u-substitution, average value of a function.

Grading System: 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 25%
Final 35%

Exam Schedule: The first midterm will be in the lab on October 8, 2021. The second midterm will be in class on November 18, 2021. The date of the final exam will be announced when the exam schedule becomes available.

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.

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.

Homework: I will send a list of homework problems to work as a practice. A homework assignment will be due every week on Tuesday. No late homework will be accepted. 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 IN THE CLASS. I will drop your lowest homework grade when determining your homework grade for the semester.

Calculator: You will need a standard scientific calculator for the class. Calculators that can store formulas or any large amounts of data ate not allowed on the test.

Class Policies: 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.Midterms

and exams must be taken on the date assigned and there will be no books, calculators, cell phones, or other aids allowed during the exams. Cell phones or other electronic devices are not allowed to be on your person during midterms and exams, per university policy.

If you miss a midterm because of one of the university accepted excuses (incapacitating illness, death in the family) a make-up midterm must be written within two weeks of the date of the original midterm. Note that documentation may be required to justify your absence, as indicated at
https://www.lakeheadu.ca/studentcentral/exams-grades/missed-exam-medical-personal.

Accessibility Services: Lakehead University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you think you may need accommodations, you are strongly encouraged to contact Student Accessibility Services (SAS) and register as early as possible. For more information, please visit: http://studentaccessibility.lakeheadu.ca

Plagiarism and academic misconduct: Exams and homework assignments must be independent work. In case of suspect academic misconduct the appropriate office will be informed and an official investigation will be initiated regarding the accident. Plagiarism is an extremely serious academic offense and carries penalties varying from failure in an assignment to expulsion from the university. See the Code under Policies - Student Related in the University Policies at www.lakeheadu.ca/faculty-and-staff/policies.

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.