

# Course Outline

## MATH 1151, Calculus I

**Instructor:** Maria Grazia Viola

**Office:** OA 3027

**E-mail:** mviola@lakeheadu.ca

**Office Hours:** Monday 1:00-2:15, Wednesday 1:00-2:15, or by appointment.

**Lectures and Lab:** Lectures on Monday 2:30-4:00 in OA 2018 and Wednesday 2:30-4:00 in OA 2006. Lab on Wednesday 4:00-5:00 in OA 2006.

**Text:** Biocalculus: Calculus, Probability, and Statistics for the Life Sciences, 1st Edition, by James Stewart and Troy Day, Cengage/Nelson.

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

1. Understand function and be able to manipulate them.
2. Understand and be able to compute limits.
3. Compute derivative of functions
4. Graph functions.
5. Model problems using functions.
6. Solve optimization problems.

### Course Outline:

- **Functions and Sequences (Chapter 1, Sections 1.1-1.5):** representation of functions, a catalog of functions, new functions from old ones, exponential functions, logarithms.
- **Limits (Chapter 2, Sections 2.2-2.5):** limits of functions at infinity, limits of functions at finite numbers, algebraic methods for limits, continuity.
- **Derivative (Chapter 3, Sections 3.1-3.8):** derivatives and rates of change, the derivative as a function, basic rules of differentiation, the product rule and the quotient rule, the chain rule, exponential growth and decay, derivative of the logarithmic and inverse tangent functions, linear approximation.
- **Applications of Derivatives (Chapter 4, Sections 4.1-4.4, 4.6):** maximum and minimum value, how derivatives affect the shape of a graph, optimization.

**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 20%  
Final 40%

**Exam Schedule:** The first midterm will be on October 4, 2017, while the second midterm will be on November 8, 2017. Each midterm will be 75 minutes.

**Homework:** Every week I will give 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.

**Make-up policy:** A make-up midterm will be given only with well documented valid university excuses (sickness, etc). A make-up midterm must be written by the student within two weeks of the date of the original midterm.

**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 dishonesty.

**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.

**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.**