MATH 273
Calculus I (4 units)

Course Outline

Sections	Topics	# of weeks
1.1–1.5	**Functions and Graphs:** Review as needed.	0.5
2.1–2.5, 4.6	**Limits:** Limits and their properties; limit laws; continuity; limits at infinity. The ϵ-δ definition should be mentioned.	2.0
3.1–3.9	**Derivatives:** The definition of derivative; rules for differentiation; implicit differentiation.	4.0
4.1, 4.3–4.10	**Applications of Differentiation:** Related rates; graph sketching; optimization problems; antiderivatives. One hour should be spent on l'Hospital's rule (§4.8). Newton's method (§4.9) is to be covered in the *SageMath* lab.	3.5
5.1–5.7	**Integration:** Definite and indefinite integrals; the Fundamental Theorem of Calculus; u-substitution.	3.0
	Tests	1.0

Textbook: *OpenStax Calculus Volume 1*, 2016 edition, by Gilbert Strang, et al..

Other Comments:

It is important that instructors complete all sections of the course outline. Instructors in the subsequent courses will not reteach material from this course. Instructors must make sufficient allowances for unforeseen class cancellations (e.g., due to weather) so that the entire course outline will still be covered.

It should be emphasized that the *SageMath* labs are an integral part of the course and that satisfactory participation in the labs is a required for the course. Students can download the laboratory material from the department home page.

This Core Curriculum course is designed to meet the following four learning goals and the instructor should keep these goals in mind when teaching the course:

- Students will construct and evaluate logical arguments.

- Students will apply and adapt a variety of appropriate strategies to solve mathematical problems.

- Students will recognize and apply mathematics in contexts outside of mathematics.

- Students will organize and consolidate mathematical thinking through written and oral communication.

Adopted: Fall 2007;   Revised: Spring 2010, Fall 2012, Fall 2018.