LAKES REGION COMMUNITY COLLEGE

Course Syllabus

- **Course Number:** MATH270L

- **Course Title/Modality:** Calculus I, Online

- **Credit Hours:** 4

- **Semester:** Spring 2024

- **Faculty Name:** Katie Seigle

- **Email Address:** kseigle@ccsnh.edu

- **Office Location:** No on campus office.

- **Office Hours:** Thursday from 6:00-7:00 via Zoom.
  Sometimes additional time or one-on-one assistance is needed. The instructor is normally available during the conference hours listed above, or you may make an appointment with the instructor for other times.

- **Prerequisites:** LMAT2350 or Precalculus equivalent with grade of C or better.

- **Course Description:** This course is designed for the student who has a strong math background. Included is a brief review of topics from Precalculus. Calculus topics include functions, limits, continuity, slope/rate of change and the derivative, rules for and applications of the derivative, derivatives of exponential and logarithmic functions, exponential growth and decay, and an introduction to integrals. Applications are aimed at business and life sciences students.

- **Text/Instructional Materials and Equipment Required:** *Calculus Volume 1* from OpenStax through Lumen Learning OHM. Students are required to purchase an access code for Lumen Learning OHM online program for all homework and chapter tests. Students must purchase the code through the LRCC bookstore. Weekly modules are set up in Canvas; students are expected to complete work as outlined in these modules and to read any notices posted. Please note use of a scientific calculator (e.g. TI-84) is required in this course.

- **Grading:** The following criteria will determine your grade for the course:

Grading Scale:

A	93-100	B	83-86	C	73-76	D	63-66
A-	90-92	B-	80-82	C-	70-72	D-	60-62
B+	87-89	C+	77-79	D+	67-69	F	0-59

Quizzes: (lowest dropped) 30%
Tests: 40%
Homework: (lowest dropped) 20%
Readings: 10%

Quizzes: Quizzes will be given weekly. Two tries on each quiz are allowed. Quizzes will be done through Lumen OHM. The lowest quiz grade will be dropped from the overall average.

Tests: Tests will cover all material from the indicated chapters. All tests are cumulative and may contain material from previous tests. Tests will be done through Lumen OHM.

Homework: Weekly homework is assigned through Lumen OHM. Assignments are expected to be completed by Sunday of each week. A 5% grade deduction will be given for late work.

Readings: Weekly readings are assigned through Lumen OHM. I highly recommend completing the readings before attempting the homework. Since this is an online course, this is the virtual "in-class" component. Be sure to submit the reading assignments to receive credit.

Cheating: If I find that you have cheated at any time, you will automatically receive a grade of "F" for this course.

Need for Assistance: Additional assistance is often needed in a math class. I am available during the office hours posted or you may make an appointment with me for other times that can be mutually agreed upon. For quick questions, email is the best method of communication. Lumen OHM provides students with the option to directly email the instructor with the specific problem. Students are encouraged to use this tool. Free peer tutoring is available through the learning lab. This is an excellent service that many students take advantage of regularly. It can often make the difference between success and failure. If you think you are going to have difficulty in this class, sign up immediately, since it can take a little time to connect with a tutor.

Attendance Policy: Students are expected to complete work on time and maintain communication with the instructor when questions arise. This is an online course, but weekly check-ins will be beneficial (but are not required) for students. Thursday Zoom sessions are not required. These are designed as student-led help sessions.

- **Course Learning Outcomes/Competencies:**

  At the conclusion of this course, the student will be able to:

  - Define the limit of a function
  - Evaluate limits, including one-sided limits
  - Identify limits that do not exist
  - Explain continuity
  - Find the slope of the tangent line to a graph
  - Interpret the slope of the tangent line
  - Find the limit of difference quotients
  - Relate the limit of difference quotients to slope
  - Define derivative in terms of slope
  - Find derivatives using the difference quotient
  - Relate differentiability and continuity
  - Apply the constant, power, sum and difference rules for differentiation
  - Solve problems involving instantaneous rate of change and velocity
  - Apply the product and quotient rules for differentiation
  - Use the chain rule
  - Find higher order derivatives
  - Use implicit differentiation
  - Solve related rate problems
  - Use the concepts of increasing/decreasing intervals, critical numbers, relative/absolute extrema, concavity, points of inflection, and horizontal/vertical asymptotes to graph functions
  - Solve optimization problems
  - Define e using limits
  - Differentiate exponential and logarithmic functions
  - Evaluate exponential growth and decay
  - Find limits involving trig functions
  - Differentiate trig functions
  - Use indefinite integral notation for antiderivatives
  - Use basic integration rules to find antiderivatives
  - Evaluate sums using summation notation
  - Approximate the area of a region using summation techniques
  - Evaluate definite integrals using limits and properties of definite integrals
  - Apply the fundamental Theorem of Calculus
  - Evaluate indefinite integrals using pattern recognition, change of variables, and the General Power rule
  - Use the Trapezoidal Rule

- **Academic Integrity and Plagiarism**
  Students must abide by the academic honesty policy as defined in the LRCC Student Handbook.

- **Diversity, Equity, and Inclusion Statement**
  The content of this course is designed to challenge your viewpoints and perspective as part of your learning experience. It is my intent that students from all backgrounds and perspectives are well-served by this course. Students' learning needs will be addressed both in and out of class, and the diversity of students will benefit the class and will be considered a resource and strength. Materials and activities presented in class will respect diversity including gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture.
- Discuss privately with me if you feel your success in the class is being impacted by experiences outside of class. I am always open to listening to students' experiences and want to find acceptable ways to process and address the issue.
- If you feel that something offensive occurred regarding DEI topics in class (by anyone) that made you feel uncomfortable, please let me know.
- Please make me aware if you have a name and/or set of pronouns that are different from those appearing on your official records.
- I encourage you to seek out other resources, such as an academic advisor or another trusted faculty member, if you feel more comfortable addressing issues with these individuals. [Anonymous feedback can be submitted here.](#)

It is my hope that this course meets your every expectation as a challenging, engaging, and respectful learning experience. If you find this not to be the case, I would welcome the opportunity to address your concerns. This is not only a courtesy; it is a matter of process and procedure. Should we fail to arrive at a mutually satisfactory understanding, you should take the matter to my immediate supervisor, Matt Simon at msimon@ccsnh.edu .

	Class Topics	**Assignments**	
Week 1 1/16	**Module 1 - Review Topics** – Functions, Operations, Exponents, Quadratics, Exponentials, Logarithms, Trigonometry	**Homework #1:** OHM Student Tutorial and Review, Sections 1.1-1.5 **Quiz#1**	**Due 1/21**
Week 2 1/22	**Module 2 - Calculus Preview and Limits**	**Reading #1:** Sections 2.1 – 2.4 **Homework #2**: Sections 2.1 – 2.4 **Quiz #2, Unit Test #1**	**Due 1/28**
Week 3 1/29	**Module 3 - Derivatives** Section 3.1 – Deining Derivatives Section 3.2 – Derivatives as a Function Section 3.3 – Differentiation Rules	**Reading #2:** Sections 3.1 – 3.3 **Homework #3**: Sections 3.1 – 3.3 **Quiz #3**	**Due 2/4**
Week 4 2/5	Section 3.4 – Rates of Change Section 3.5 – Derivatives of Trig Functions	**Reading #3:** Sections 3.4 – 3.5 **Homework #4**: Sections 3.4 – 3.5 **Quiz #4**	**Due 2/11**
Week 5 2/12	Section 3.6 – The Chain Rule Section 3.7 – Derivatives of Inverse Functions	**Reading #4:** Sections 3.6 – 3.7 **Homework #5**: Sections 3.6 – 3.7 **Quiz #5**	**Due 2/18**
Week 6 2/19	Section 3.8 – Implicit Differentiation Section 3.9 – Derivatives of Logarithms and Exponents	**Reading #5:** Sections 3.8 – 3.9 **Homework #6**: Sections 3.8 – 3.9 **Quiz #6, Unit Test #2**	**Due 2/25**
Week 7 2/26	**Module 4 - Applications of Derivatives** Section 4.1 – Related Rates Section 4.2 – Linear Approximations and Differentials	**Reading #6:** Sections 4.1 - 4.2 **Homework #7**: Sections 4.1 - 4.2 **Quiz #7**	**Due 3/3**
Week 8 3/4	Section 4.3 – Max and Min Section 4.4 – Mean Value Theorem	**Reading #7:** Sections 4.3 – 4.4 **Homework #8**: Sections 4.3 – 4.4 **Quiz #8**	**Due 3/10**
Week 9 3/18	Section 4.5 – Derivatives and the Shape of the Graph Section 4.6 – Limits and Asymptotes	**Reading #8:** Sections 4.5 – 4.6 **Homework #9**: Sections 4.5 – 4.6 **Quiz #9**	**Due 3/24**
Week 10 3/25	Section 4.7 - Optimization Section 4.8 - L'Hopital's Rule	**Reading #9:** Sections 4.7 – 4.8 **Homework #9**: Sections 4.7 – 4.8 **Quiz #10**	**Due 3/31**
Week 11 4/1	Section 4.9 – Newton's Method Section 4.10 – Antiderivatives	**Reading #10:** Sections 4.9 – 4.10 **Homework #11**: Sections 4.9 – 4.10 **Quiz #11, Unit Test #3**	**Due 4/1**
Week 12 4/1	**Module 5 - Integration** Section 5.1 – Approximating Area Section 5.2 – Definite Integral	**Reading #11:** Sections 5.1 – 5.2 **Homework #12**: Sections 5.1 – 5.2 **Quiz #12**	**Due 4/7**

Week 13 **4/8**	Section 5.3 – Fundamental Theorem of Calculus Section 5.4 - Integration Formulas	**Reading #12:** Sections 5.3 – 5.4 **Homework #13**: Sections 5.3 – 5.4 **Quiz #13**	**Due 4/14**
Week 14 **4/15**	Section 5.5 - Substitution Section 5.6 - Integrals with Exponents and Logarithms	**Reading #13:** Sections 5.5 – 5.6 **Homework #14**: Sections 5.5 – 5.6 **Quiz #14**	**Due 4/21**
Week 15 **4/22**	Section 5.7 - Inverse Trig Functions Section 5.8 - Approximating Integrals	**Reading #14:** Sections 5.7 – 5.8 **Homework #15**: Sections 5.7 – 5.8 **Quiz #15, Unit Test #4**	**Due 4/28**
Week 16 **4/29**	No new material.	**Final Exam**	**Due 5/3**