

LAKES REGION COMMUNITY COLLEGE

379 Belmont Road
Laconia, NH 03246
(603) 524-3207

COURSE OUTLINE/SYLLABUS SHEET

- **COURSE NO:** MATH235L

- **COURSE TITLE:** Pre-Calculus

- **CREDIT HOURS:** 4

- **SEMESTER:** Fall 2021

- **INSTRUCTOR NAME:** Katie Seigle

- **E-MAIL ADDRESS:** kseigle@ccsnh.edu

- **OFFICE LOCATION:** No on campus office.

- **CONFERENCE HOURS:** Thursday 6:00-7:00 via Zoom. Additional time available per student request. Link will be posted on Canvas course page.

- **PREREQUISITES:** LMAT211L or equivalent with a grade of C or better

- **COURSE DESCRIPTION:** This course is designed for the student who has a strong math background. Topics in this course include polynomial, rational, trigonometric, logarithmic, and exponential functions and their graphs; trigonometry and the unit circle; trigonometric identities; composite and inverse functions; logarithmic and exponential equations; solution of higher degree equations; quadratic, rational, and absolute value inequalities.

TEXT/INSTRUCTIONAL MATERIALS AND EQUIPMENT NEEDED:

Text: *Precalculus*, an adaptation of *Precalculus* by OpenStax. Students are required to purchase an access code for Lumen Learning OHM online program for all homework and chapter tests. Access to the textbook is available through the Lumen site. Students can purchase the code through the LRCC bookstore or directly through Lumen. 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:

<u>Category</u>	<u>Percentage of Course Grade</u>
Quizzes: (lowest dropped)	30%
Tests:	40%
Homework: (lowest dropped)	20%
Readings	10%

**If the final exam grade is higher than the cumulative test average, the final exam grade will be used for the test average.*

The following grading scale will be used to assign your final grade:

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: 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.

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

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- **NEED FOR ASSISTANCE:** Often additional assistance is 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 sometimes take a little time to connect you with a tutor.

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- **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 OUTCOMES/COMPETENCIES:**

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

- Use set builder and interval notation
- Factor algebraic expressions containing fractional and negative exponents
- Solve quadratic and higher degree equations as well as equations containing radicals, absolute value, or rational exponents
- Solve quadratic, rational, absolute value, and compound inequalities
- Find slopes and equations of intersecting, perpendicular, or parallel lines
- Recognize equations of horizontal and vertical lines
- Define function, step function, and piecewise function
- Find the domain and range of a function and evaluate functions at given values
- Find a function's difference quotient
- Identify intervals on which a function increases, decreases, or remains constant
- Find average rate of change of a function and average velocity
- Identify even or odd functions and recognize their symmetries
- Graph functions using vertical and horizontal shifts, reflections, vertical shrinking or stretching, vertical/horizontal/slant asymptotes
- Combine functions, form composite functions, and find the inverse of a function
- Solve problems involving maximizing/minimizing quadratic functions
- Recognize characteristics of graphs of polynomial functions, including local max/min
- Use factoring, synthetic division, and the Factor Theorem to find zeros of polynomial functions
- Evaluate and graph exponential functions
- Solve exponential equations
- Evaluate and graph common and natural logarithms
- Use the properties of logarithms to simplify expressions and solve equations and problems
- Convert between radians and degrees
- Find arc length and linear speed
- Define trig functions using the unit circle and right triangles
- Use the Law of Sines and the Law of Cosines
- Solve problems using right triangles and oblique triangles
- Recognize domain, range, and period of trig functions
- Graph trig functions
- Use trig identities to simplify expressions and to solve equations
- Graph trig functions and variations

EXPECTATIONS: The following will be expected from all students:

- Behave in an ethical manner (all work is your own, use legitimate resources, do not abuse absences, etc.)
- Complete assignments in a timely manner. When deadlines are given, meet them; do not procrastinate.
- Conduct yourself appropriately for a college learning environment.

- Work effectively as a member of a group.
- Work independently when required.
- Use a variety of sources (text, teacher, videos, computer programs, alternate books, other students when appropriate, etc.) to achieve proficiency in the course competencies. Remember, it is your responsibility to learn the material.

It is my hope that this course meets your every expectation as a challenging, engaging, 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 outlined in the LRCC Student Handbook. Should we fail to arrive at a mutually satisfactory understanding, you should refer the matter to my immediate supervisor, Program Coordinator Matt Simon (msimon@ccsnh.edu).

Course Schedule (Fall 2021)

Instructor may announce changes to this schedule in Canvas. Students are expected to stay informed of changes.

	Class Topics	Assignments
Week 1 8/30	Module 1-Introduction to Functions Section 1.1 - Functions Section 1.2 - Domain and Range Section 1.3 - Rates of Change and Graphs	Reading #1: Sections 1.1 – 1.3 Homework #1: OHM Student Tutorial and Review, Sections 1.1-1.3 Quiz#1 Due 9/5
Week 2 9/7	Section 1.4 - Composition of Functions Section 1.5 - Transformation of Functions Section 1.6 - Absolute Value Functions Section 1.7 - Inverse Functions	Reading #2: Sections 1.4 – 1.7 Homework #2: Sections 1.4-1.7 Quiz #2, Unit Test #1 Due 9/12
Week 3 9/13	Module 2 - Linear Functions Section 2.1 – Linear Functions Section 2.2 – Graphs of Linear Functions Section 2.3 – Modeling with Linear Section 2.4 - Fitting Linear Models to Data	Reading #3: Sections 2.1 – 2.4 Homework #3: Sections 2.1 – 2.4 Quiz #3 Due 9/19
Week 4 9/20	Module 3 - Polynomials and Rationals Section 3.1 – Complex Numbers Section 3.2 – Quadratic Functions Section 3.3 - Graphs of Polynomials	Reading #4: Sections 3.1 – 3.3 Homework #4: Sections 3.1 – 3.3 Quiz #4 Due 9/26
Week 5 9/27	Section 3.4 – Dividing Polynomials Section 3.5 - Zeros of Polynomials Section 3.6 - Rational Functions	Reading #5: Sections 3.4 – 3.6 Homework #5: Sections 3.6 – 3.7 Quiz #5 Due 10/3
Week 6 10/4	Section 3.7 – Inverse Functions Section 3.8 – Modeling Using Variation	Reading #6: Sections 3.7 – 3.8 Homework #6: Sections 3.7 – 3.8 Quiz #6, Unit Test #2 Due 10/10
Week 7 10/12	Module 4 - Exponential and Logarithmic Functions Section 4.1 – Exponential Functions Section 4.2 – Graphs of Exponentials Section 4.3 – Logarithmic Functions	Reading #7: Sections 4.1 - 4.3 Homework #7: Sections 4.1 - 4.3 Quiz #7 Due 10/17
Week 8 10/18	Section 4.4 – Graphs of Logarithmic Fxns Section 4.5 – Logarithmic Properties Section 4.6 – Exponential and Logarithmic Equations	Reading #8: Sections 4.4 – 4.6 Homework #8: Sections 4.4 – 4.6 Quiz #8 Due 10/24
Week 9 10/25	Section 4.7 – Exponential and Logarithmic Models Section 4.8 – Fitting Models to Data	Reading #9: Sections 4.7 – 4.8 Homework #9: Sections 4.7 – 4.8 Quiz #9 Due 10/31
Week 10 11/1	Module 5 - Systems of Equations Section 5.1 – Two Variables Section 5.2 – Three Variables Section 5.3 – Systems of Nonlinear	Reading #10: Sections 5.1 – 5.3 Homework #10: Sections 5.1 – 5.3 Quiz #10, Unit Test #3 Due 11/7
Week 11 11/8	Module 6 - Trig Functions Section 6.1 – Angles Section 6.2 – Unit Circle Sine/Cosine Section 6.3 – Other Trig Functions Section 6.4 – Right Triangle Trig	Reading #11: Sections 6.1 – 6.4 Homework #11: Sections 6.1 – 6.4 Quiz #11 Due 11/14
Week 12 11/15	Module 7 - Periodic Functions Section 7.1 – Graphs of Sine and Cosine Section 7.2 – Graphs of Others Section 7.3 – Inverse Trig Functions	Reading #12: Sections 7.1 – 7.3 Homework #12: Sections 7.1 – 7.3 Quiz #12, , Unit Test #4 Due 11/21
Week 13 11/22	Module 8 - Trig Identities Section 8.1 – Solving with Identities Section 8.2 – Sum and Difference Section 8.3 – Double, Half, and Reduction	Reading #13: Sections 8.1 – 8.3 Homework #13: Sections 8.1 – 8.3 Quiz #13 Due 11/28
Week 14 11/29	Section 8.4 - Sum to Product Section 8.5 - Solving Section 8.6 - Modeling	Reading #14: Sections 8.4 – 8.6 Homework #14: Sections 8.4 – 8.6 Quiz #14 Due 12/5

Week 15 12/6	Module 10 - Non-Right Triangles Section 10.1 – Law of Sines Section 10.2 – Law of Cosines	Reading #15: Sections 10.1 – 10.2 Homework #15: Sections 10.1 – 10.2 Quiz #15, Unit Test #5	Due 12/12
Week 16 12/13	No new material.	Final Exam	Due 12/17