In Math 1210, students learn about:

- the concept of limit and compute a variety of limits of algebraic and trigonometric expressions, including limits of form 0/0 (that simplify), non-zero number over 0, including limits that go to (positive or negative) infinity, limits that don't exist and limits that are finite.
- continuity, which is defined using limits, and the important consequences of continuity.
- using limits to compute the derivatives of certain functions (including polynomials, rational functions, and trigonometric functions). You will understand the derivative as the instantaneous rate of change of a function.
- differentiation rules which allow you to differentiate all polynomial, rational, radical, and trigonometric functions and compositions of those functions.
- applying these differentiation rules to related rates and implicit differentiation applications.
- how the derivative locally approximates a function by a linear function, which allows you to approximate function values (linear approximation) and changes in functions (differentials).
- what the first and second derivatives tell us about the behavior of a function. You will find critical points and inflection points and, together with domain and asymptote information obtained from limits, use this information to sketch a detailed graph of the function.
- how differentiation concepts allow us to find maximum and minimum values and apply these techniques in practical situations.
- antiderivatives and applications of antiderivatives.
- how to approximate the area underneath the graph of a function using Riemann sums, and how in the limit as these approximations become better and better, we obtain the definite integral. We will compute definite integrals using this definition for simple polynomial functions.
- the Fundamental Theorem of Calculus, which relates the definite integral to antiderivatives. The Fundamental Theorem of Calculus and some basic techniques of integration, including u-substitution, will al-

low us to compute definite integrals.

- applications of the definite integral, including area between two curves, volumes of solids of revolutions, arc length, surface area for surfaces of revolution, and work problems.