

Spring 2022

**Syllabus — Math 161**  
**Precalculus and Elements of Calculus**  
**for Economics and the Social Sciences**  
**(3 credits)**

**Course Description:** Algebra review, functions with special attention to polynomial, rational, exponential, and logarithmic functions, algebra of functions, techniques of graphing, differentiation and integration of algebraic functions, applications in economics and social sciences. Credit allowed for only one of 134, 135, or 161. A–F only.

**Textbook:** Any regular Precalculus text will do for the first part of the course. For the calculus part of the course, we may have to work with lecture notes.

**Approximate Timeline:**

1. **Fundamentals (3 Weeks):** Sets of real numbers, review of elementary algebra, solving equations and inequalities, coordinate geometry, graphs of lines.
2. **Polynomial and Rational Functions (3 Weeks):** Graphing polynomial and rational functions, asymptotes and singularities, division algorithm, factor theorem, remainder theorem, the Fundamental Theorem of Algebra.
3. **Logarithmic and Exponential Functions (3 Weeks):** Graphing exponential and logarithmic functions, laws of logarithms, modeling and applications.
4. **Differentiation (3.5 Weeks):** Tangent lines, differentiability, rules of differentiation and derivatives of algebraic functions, the derivative as rate of change, applications.
5. **Integration (2.5 Weeks):** Integrability, Fundamental Theorem of Calculus, areas under graphs and accumulation, applications.

**Course Objectives and Student Learning Outcomes.** Upon successful completion of Math 161, the student will be able to work with, apply, and answer questions pertaining to *Precalculus*, differentiate and integrate algebraic functions, and apply basic ideas of calculus to economics and the social sciences.

**Program Objectives.** Math 161 is a course designed to strengthen the mathematical preparation of students in economics and the social sciences, and to expose these students to basic uses of the calculus.