

Mathematics 112. Algebra Syllabus for Instructors

• Required Course Materials:

- (1) Lecture Notes: *College Algebra Lecture Notes*: available at TIS and UIB bookstores.
- (2) ALEKS course semester code: purchase at www.aleks.com/uiuc

• Course Description:

This class has a blended format in which half of the content is delivered in lecture and half is delivered online. Rapid review of basic techniques of factoring, rational expressions, equations and inequalities; functions and graphs; exponential and logarithm functions; systems of equations; polynomials; and the binomial theorem, unit circle trigonometry.

• **Prerequisite:** Three years of high school mathematics, including two years of algebra and one year of geometry.

• Tentative Topic Schedule by Week

- (1) Real Numbers; Interval Notation; Absolute Value Integer Exponents; Radicals; Rational Exponents
- (2) Algebraic Expressions; Factoring Rational Expressions
- (3) Equations – Basic, Quadratic, Other Types, Absolute Value
- (4) Modeling with Equations
- (5) Inequalities – Linear, Non-linear, Absolute Value
- (6) Coordinate Geometry; Graphing Equations; Symmetry Lines
- (7) Functions; Graphs of Function
- (8) Increasing/Decreasing Functions; Avg Rate of Change; Transformations of Functions
- (9) Quadratic Functions; Combining Functions
- (10) One-to-One Functions and Inverses
- (11) Polynomial Functions; Dividing Polynomials
- (12) Real Zeros of Polynomials
- (13) Rational Functions
- (14) Exponential Functions; Logarithmic Functions
- (15) Laws of Logarithms; Exponential and Log Equations; Modeling with Exp and Log Functions