



Department of Mathematics
Johns Hopkins University

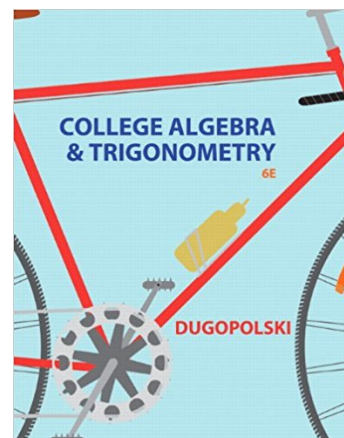
AS.110.105 Precalculus Course Syllabus

Course Description: This course provides students with the background necessary for the study of calculus. Includes a review of algebra, trigonometry, exponential and logarithmic functions, coordinates and graphs. Each of these tools is introduced in its cultural and historical context. The concept of the rate of change of a function will be introduced. This course is not open to students who have studied calculus in high school.

Text: **College Algebra and Trigonometry**, 6th Edition, Dugopolski, M., New Jersey: Pearson, January, 2014, ISBN-10: 0321916522, ISBN-13: 978-0321916525.

Course Topics

- **Prerequisites (1- weeks)**
 - Chapter P
- **Equations, Inequalities, and Modeling (2- weeks)**
 - 1.1 Linear, Rational & Absolute Value Equations
 - 1.2 Constructing Models to Solve Problems
 - 1.3 Equations and Graphs in Two Variables
 - 1.4 Linear Equations in Two Variables
 - 1.5 Quadratic Equations
 - 1.6 Miscellaneous Equations
 - 1.7 Linear and Absolute Value Inequalities
- **Functions and Graphs (1+ weeks)**
 - 2.1 Functions
 - 2.2 Graphs of Relations and Functions
 - 2.3 Families of Functions, Transformations, and Symmetry
 - 2.4 Operations with Functions
 - 2.5 Inverse Functions
- **Polynomial and Rational Functions (1+ weeks)**
 - 3.1 Quadratic Functions and Inequalities
 - 3.2 Zeros of Polynomial Functions
 - 3.3 The Theory of Equations
 - 3.4 Graphs of Polynomial Functions
 - 3.5 Rational Functions and Inequalities
- **Exponential and Logarithmic Functions (1 week)**
 - 4.1 Exponential Functions and Their Applications
 - 4.2 Logarithmic Functions and Their Applications
 - 4.3 Rules of Logarithms
 - 4.4 More Equations and Applications





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- **The Trigonometric Functions (2- weeks)**
 - 5.1 Angles and Their Measurements
 - 5.2 The Sine and Cosine Functions
 - 5.3 The Graphs of the Sine and Cosine Functions
 - 5.4 The Other Trigonometric Functions and Their Graphs
 - 5.5 The Inverse Trigonometric Functions
 - 5.6 Right Triangle Trigonometry

- **Trigonometric Identities (2 weeks)**
 - 6.1 Basic Identities
 - 6.2 Verifying Identities
 - 6.3 Sum and Difference Identities
 - 6.4 Double-Angle and Half-Angle Identities
 - 6.5 Product and Sum Identities
 - 6.6 Conditional Trigonometric Equations

- **Applications of Trigonometry (2- weeks)**
 - 7.1 The Law of Sines
 - 7.2 The Law of Cosines
 - 7.3 Vectors
 - 7.4 Trigonometric Form of Complex Numbers
 - 7.5 Powers and Roots of Complex Numbers

- **Systems of Equations and Inequalities (1- week)**
 - 8.1 Systems of Linear Equations in Two Variables
 - 8.2 Systems of Linear Equations in Three Variables