

Walter Payton College Prep
Precalculus BC Course Outline 2014- 2015
Textbook: Precalculus, 7th ed. (Cohen, Lee, Sklar)

Quarter 1:

Topics:

- Parametric Graphing: students practice old skills in a new context by working with parametrically defined curves
- Review of function notation, domain, range, inverse functions, relations, from Algebra 2
- Review/introduction to increasing/decreasing and concave up/concave down
- Graph transformations and symmetry
- Modeling functions with real data via the Nspire and Geometer's Sketchpad.
- Average rate of change (ARC) and instantaneous rate of change (IRC), graphically and symbolically
- Arithmetic, geometric, and other sequences and series, defined recursively and explicitly
- Partial sums and sigma notation
- Binomial theorem and binomial probability
- Using inductive reasoning in problems and writing inductive proofs

Quarter 2:

Topics:

- Review properties of exponents
- Solve radical equations with the aid of CAS
- Learning to manipulate and interpret exponential and logarithmic models
- Exploring interest rate problems and the number e
- Review polynomial functions and explore rational functions and their graphs in context of limits
- Solving triangles and polygons with trigonometry

Quarter 3:

Topics:

- Circle geometry involving radian measure, arc length, angular speed
- Constructing the unit circle in radians
- Solving basic trigonometric equations using unit circle identities
- Modeling periodic behavior (including simple harmonic motion) with transformed trig functions
 - This involves introduction of amplitude, period, and phase shift
- Derive inverse trig functions, especially noting domain and range
- Deriving/Proving more difficult trig identities
- Solving more complicated trig equations

Quarter 4:

Topics:

- Graph polar coordinates and simple polar graphs
- Learning complex numbers and their role in the Fundamental Theorem of Algebra
- Factor theorem and remainder theorem
- Theory of equations
- Understanding how to convert between rectangular and polar coordinates
- DeMoivre's Theorem
- Vector applications and cross and dot products
- More work with parametrics: graphing lines in 3-space, graphing conics, graphing other interesting curves.
- Locus definitions of conics
- Equations of conics in Cartesian coordinates
- Using matrices for Markov Chains
- Bonus lesson: bijections, cardinality, and orders of infinity.