# Georgia Perimeter College
## Common Course Outline

<table>
<thead>
<tr>
<th>Course Abbreviation &amp; Number:</th>
<th>MATH 1113</th>
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<tbody>
<tr>
<td>Course Title:</td>
<td>Precalculus</td>
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<tr>
<td>Credit Hours:</td>
<td>3</td>
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</table>

### Prerequisites:
- Math 1111 with a C or better or appropriate placement

### Co-requisites:
- None

### Course Description:
This course is an intensive study of the basic functions needed for the study of calculus. Topics include algebraic, functional, and graphical techniques for solving problems with algebraic, exponential, logarithmic, and trigonometric functions and their inverses.

### Expected Educational Results:
As a result of completing this course, the student will be able to:

1. Graph rational functions with an emphasis on understanding and describing the asymptotic behavior near vertical and horizontal asymptotes.
2. Apply the right triangle definitions of the trigonometric functions.
3. Convert between degrees and radians and solve problems involving lengths of circular arcs.
4. Apply the unit circle definitions of the six trigonometric functions.
5. Graph the six basic trigonometric functions and graph transformations of sine and cosine.
7. Apply the Pythagorean, addition and subtraction, and double-angle identities.
8. Verify trigonometric identities.
9. Apply the definitions of inverse sine, inverse cosine, and inverse tangent and be able to graph these functions.
10. Solve equations involving trigonometric functions.
11. Represent vectors both algebraically and geometrically, perform scalar
multiplication, find the sum of two vectors, find the magnitude of a vector, and decompose a vector into horizontal and vertical components.

12. Graph exponential and logarithmic functions with an emphasis on understanding and describing the end behavior and the behavior near asymptotes.

13. Use Laws of Logarithms to rewrite logarithmic expressions.


15. Set up and simplify difference quotients.

**General Educational Outcomes:**

This course supports the general education outcome that “Students will be able to demonstrate the ability to interpret and analyze quantitative information; to apply mathematical principles and techniques; and to use mathematical models to solve applied problems.”

**Course Content:**

(Order of Topics May Vary)

1. Trigonometric Functions
   a. Radian and Degree Measure
   b. Right Triangle Trigonometry with Applications
   c. The Unit Circle and Definitions of Trigonometric Functions
   d. Graphs of Sine and Cosine Functions
      i. Basic Graphs
      ii. Amplitude, Period, Phase Shifts, and Vertical Shifts
   e. Graphs of Other Trigonometric Function
   f. Inverse Sine, Inverse Cosine, and Inverse Tangent
      i. Definitions and Applications
      ii. Graphs

2. Analytic Trigonometry
   a. Fundamental Identities
   b. Verifying Trigonometric Identities
   c. Addition and Subtraction Formulas
   d. Double-Angle Formulas
   e. Solving Trigonometric Equations

3. Additional Topics in Trigonometry
   a. Law of Sines with Applications
   b. Law of Cosines with Applications
   c. Vectors

4. Additional Topics in Algebra
   a. Graphing Rational Functions
   b. Exponential and Logarithmic Functions
   c. Difference Quotients
### Assessment of Outcome Objectives

#### Course Grade:

The course grade will be determined by the individual instructor using a variety of methods such as exams, quizzes, projects, or homework. The method for determining the course grade should be clearly explained on the course syllabus and is subject to department chair approval.

A comprehensive final examination is required which must count at least one-fifth and no more than one-third of the course grade.

#### Course Assessment:

- This course will be regularly assessed in accordance with GPC policies. The course will be assessed at least once every three years.
- The assessment instrument will be a ten to twelve question multiple-choice assessment developed by the Math 1113 course committee.
- The assessment will be administered in all sections as part of the final exam.
- The criteria for success on each assessment item would be for 70% of the students to correctly answer the item.

#### Use of Assessment Findings:

The Math 1113 committee will analyze the results of the assessment and determine implications for curriculum changes. The committee will prepare a report that summarizes its findings for the Academic Group.

#### Last Revised:

October, 2014