## Course Title:
Trigonometry with Integrated Algebra

## Course Number:
00275

## Course Prerequisites:
Recommended grade of at least 70% in Algebra I CP, Algebra II CP, and Geometry CP

### Course Description:
Trigonometry is a specialist branch of geometry that deals with the study of triangles. In trigonometry, mathematicians study the relationships between the sides and angles of triangles. Right triangles, which are triangles with one angle of 90 degrees, are a key area of study in this area of mathematics. The content of this course includes functions and graphs, the Pythagorean Theorem, all six trig functions and their graphs, the study of trig identities, the Law of Sine’s and the Law of Cosines applied to triangles, inverse functions and equations, polar coordinates with graphs and a review of Algebra II. Applications of this branch of mathematics and algebra in real life are many and varied. This course is recommended for students interested in pursuing careers in engineering, surveying, astronomy, architecture, and aeronautical studies. A final exam is required for this course.

### Suggested Grade Level:
11 - 12

### Length of Course:
- [X] Two Semesters
- [ ] Other

(Describe)

### Units of Credit:
1

(Insert NONE if appropriate.)

### PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certification(s)
(Insert certificate title and CSPG#)
- CSPG #50 Mathematics

Certification verified by WCSD Human Resources Department:

- [X] Yes
- [ ] No

### Board Approved Textbooks, Software, Materials:
Title: Trigonometry 8th ed.
Publisher: Prentice Hall
ISBN #: 0 321 24543-1
BOARD APPROVAL:

Date Written: August 5, 2014
Date Approved: September 8, 2014
Implementation Year: 2014-2015

Suggested Supplemental Materials: (List or insert None)
Kuta Software

Course Standards

PA Academic Standards: (List by Number and Description)
2.1 Numbers and Operations
2.2 Algebraic Concepts
2.3 Geometry

Common Core Standards:

A-CED Creating Equations
A-REI Reasoning with Equations & Inequalities
A-SSE Seeing Structure in Expressions
F-IF Interpreting Functions
F-BF Building Functions
F-LE Linear, Quadratic, and Exponential Models
F-TF Trigonometric Functions
G-SRT Similarity, Right Triangles, & Trigonometry

WCSD Academic Standards: (List or None)
None

Industry or Other Standards: (List, Identify Source or None)
None

SPECIAL EDUCATION AND GIFTED REQUIREMENTS

The teacher shall make appropriate modifications to instruction and assessment based on a student's Individual Education Plan (IEP) or Gifted Individual Education Plan (GIEP).
SPECIFIC EDUCATIONAL OBJECTIVES/CORRESPONDING STANDARDS AND ELIGIBLE CONTENT WHERE APPLICABLE
(List Objectives, PA Standards #'s, Other Standards (see samples at end))

PA Standard: 2.1 Numbers and Operations

<table>
<thead>
<tr>
<th>Performance Indicators</th>
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<tbody>
<tr>
<td>A. Apply and extend the properties to solve problems with rational exponents.</td>
</tr>
<tr>
<td>B. Extend the knowledge of arithmetic operations and apply to complex numbers.</td>
</tr>
<tr>
<td>C. Apply concepts of complex numbers in polynomial identities and quadratic equations to solve.</td>
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</table>

PA Standard: 2.2 Algebraic Concepts

<table>
<thead>
<tr>
<th>Performance Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Write expressions in equivalent forms to solve problems.</td>
</tr>
<tr>
<td>B. Understand the relationship between zeros and factors of polynomials to make generalizations about functions and their graphs.</td>
</tr>
<tr>
<td>C. Extend the knowledge of rational functions to rewrite in equivalent forms.</td>
</tr>
<tr>
<td>D. Create and graph equations or inequalities to describe numbers or relationships.</td>
</tr>
<tr>
<td>E. Apply inverse operations to solve equations or formulas for a given variable.</td>
</tr>
<tr>
<td>F. Use reasoning to solve equations and justify the solution method.</td>
</tr>
<tr>
<td>G. Represent, solve, and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.</td>
</tr>
<tr>
<td>H. Use the concept and notation of functions to interpret and apply them in terms of their context.</td>
</tr>
<tr>
<td>I. Graph and analyze functions and use their properties to make connections between the different representations.</td>
</tr>
<tr>
<td>J. Construct and compare linear, quadratic, and exponential models to solve problems.</td>
</tr>
<tr>
<td>K. Apply radian measure of an angle and the unit circle to analyze the trigonometric functions.</td>
</tr>
<tr>
<td>L. Choose trigonometric functions to model periodic phenomena and describe the properties of the graphs.</td>
</tr>
<tr>
<td>M. Prove the Pythagorean identity and use it to calculate trigonometric ratios.</td>
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</table>

PA Standard: 2.3 Geometry

<table>
<thead>
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<th>Performance Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Extend the concept of similarity to determine arc lengths and areas of sectors of circles.</td>
</tr>
<tr>
<td>B. Apply coordinate geometry to prove simple geometric theorems algebraically.</td>
</tr>
</tbody>
</table>

ASSESSMENTS

PSSA Assessment Anchors Addressed: The teacher must be knowledgeable of the PDE Assessment Anchors and/or Eligible Content and incorporate them into this planned instruction. Current assessment anchors can be found at pde@state.pa.us.
Formative Assessments:
The teacher will develop and use standards-based assessments throughout the course.

Portfolio Assessment:  _____ Yes  ____ X____ No

District-wide Final Examination Required:  ____ X____ Yes  _____ No

Course Challenge Assessment:
Course challenge assessment will be based on activities and exams that measure student proficiency as the course standards at 84%.

REQUIRED COURSE SEQUENCE AND TIMELINE
(Content must be tied to objectives)

Content Sequence
Algebra 2 Review
Exponential Functions
Trigonometric Functions
Acute Angles & Right Triangles
Radian Measure & Circular Functions
Graphs of the Circular Functions
Trigonometric Identities
Inverse Circular Functions & Trigonometric Equations
Complex Numbers, Polar Equations, & Parametric Equations

• Refer to Course Map on Performance Plus for Additional Information

WRITING TEAM:  Warren Country School District Math Teachers

WCSD STUDENT DATA SYSTEM INFORMATION
1. Is there a required final examination?  ____ X____ Yes  _____ No
2. Does this course issue a mark/grade for the report card?  ____ X____ Yes  _____ No
3. Does this course issue a Pass/Fail mark?  _____ Yes  ____ X____ No
4. Is the course mark/grade part of the GPA calculation?  ____ X____ Yes  _____ No
5. Is the course eligible for Honor Roll calculation?  ____ X____ Yes  _____ No
6. What is the academic weight of the course?
   _____ No weight/Non credit  ____ X____ Standard weight
   _____ Enhanced weight (Describe)