

**COURSE OF STUDY
MATHEMATICS**

Name of Course: Honors PreCalculus

Length of Course: 180 Days

Course Number: 341

Type of Offering: Academic

Grade Level: 11

Credit Value: 1 credit

Prerequisite/s: Honors Geometry and Honors Algebra 2

Minutes: 7200

COURSE DESCRIPTION:

This course includes pre-calculus mathematics topics such as polar coordinates, complex numbers, variables, trigonometry, vector spaces, limit theory, and elementary functions.

TEXTBOOK/S (if applicable)

Title: Pre-Calculus 7th Edition

Publisher: Houghton Mifflin

Copyright: 2007

OTHER RESOURCES: Textbook Ancillary Materials

Teacher Generated Materials

Calculator Applications

Computer Software Applications

Internet-Based Applications

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Prerequisites Algebra II Skills

Instructional Time: 800minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
<p>2.2.11. A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.</p> <p>2.8.11. J Demonstrate the connection between algebraic equations and inequalities and the geometry of relations in the coordinate plane.</p> <p>2.2.11. A Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.</p> <p>2.2.11.D Formulate expressions, equations, inequalities, systems of equations, systems of inequalities and matrices to model routine and non-routine problem situation.</p>	<p>Real Number System</p> <p>Cartesian Coordinate System</p> <p>Linear Equations and Inequalities</p>	<ul style="list-style-type: none"> -Lecture and Demonstration -Question and Answer -Brainstorming -Discussion -Journal -Cooperative Learning -Exercises -Practice and Application 	<ul style="list-style-type: none"> -Textbook- Precalculus, Graphical, Numerical, Algebraic Addison Wesley Longman Inc. 2001, -Teacher Generated Materials -Calculator Applications -Computer Applications -Internet-Based Applications 	<ul style="list-style-type: none"> -Homework -Tests -Quizzes -Projects

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Prerequisites Algebra II Skills

Instructional Time: 800minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
<p>2.2.11.D Formulate expressions, equations, inequalities, systems of equations, systems of inequalities and matrices to model routine and non-routine problem situation.</p> <p>2.8.11. H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.</p>	<p>Solving Inequalities Graphically, Numerically and Algebraically</p>			

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Functions and Graphs

Instructional Time: 800minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
<p>2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).</p> <p>2.8.11 T Analyze and categorize functions by their characteristics.</p> <p>2.8.11 Q Represent functional relationships in tables, charts and graphs.</p> <p>2.8.11 R Create and interpret functional models.</p> <p>2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).</p> <p>2.8.11 T Analyze and categorize functions by their characteristics.</p>	<p>Ten Basic Trig Function</p>			

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Polynomial, Power and Rational Functions

Instructional Time: 800minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
2.8.11 Q Represent functional relationships in tables, charts and graphs. 2.8.11 R Create and interpret functional models. 2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).	Linear , Quadratic and Power Functions with Modeling	-Lecture and Demonstration -Question and Answer -Brainstorming -Discussion -Journal -Cooperative Learning -Exercises -Practice and Application	-Textbook- Precalculus, Graphical, Numerical, Algebraic Addison Wesley Longman Inc. 2001, -Teacher Generated Materials -Calculator Applications -Computer Applications -Internet-Based Applications	-Homework -Tests -Quizzes -Projects
2.8.11 Q Represent functional relationships in tables, charts and graphs. 2.8.11 R Create and interpret functional models. 2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).	Polynomial Functions of Higher Degree with Modeling			

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Polynomial, Power and Rational Functions

Instructional Time: 800minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
2.8.11 N Solve linear, quadratic and exponential equations both symbolically and graphically. 2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).	Real Zeros of Polynomial Functions			-
2.8.11 N Solve linear, quadratic and exponential equations both symbolically and graphically.	Complex Numbers			

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Polynomial, Power and Rational Functions

Instructional Time: 800minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
<p>2.8.11 R Create and interpret functional models.</p> <p>2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).</p> <p>2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).</p> <p>2.8.11 J Demonstrate the connection between algebraic equations and inequalities and the geometry of relations in the coordinate plane.</p>	<p>Complex Zeros and the Fundamental Theorem of Algebra</p> <p>Rational Functions and Equations</p> <p>Solving Inequalities in One Variable</p>			

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Exponential, Logistic and Logarithmic Functions

Instructional Time: 800minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
<p>2.8.11 Q Represent functional relationships in tables, charts and graphs. 2.8.11 R Create and interpret functional models. 2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).</p>	<p>Exponential and Logistic Functions and Modeling</p>	<p>-Lecture and Demonstration -Question and Answer -Brainstorming -Discussion -Journal -Cooperative Learning -Exercises -Practice and Application</p>	<p>-Textbook- Precalculus, Graphical, Numerical, Algebraic Addison Wesley Longman Inc. 2001, -Teacher Generated Materials -Calculator Applications -Computer Applications -Internet-Based Applications</p>	<p>-Homework -Tests -Quizzes -Projects</p>
<p>2.8.11 Q Represent functional relationships in tables, charts and graphs. 2.8.11 R Create and interpret functional models. 2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).</p>	<p>Logarithmic Functions and Their Graphs</p>			

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Exponential, Logistic and Logarithmic Functions

Instructional Time: 800minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).	Properties of Logarithmic Functions			
2.8.11 N Solve linear, quadratic and exponential equations both symbolically and graphically.	Equation Solving and Modeling			
2.8.11 N Solve linear, quadratic and exponential equations both symbolically and graphically.	Mathematics of Finance			

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Trigonometric Functions

Instructional Time: 800minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
<p>2.3.11 A Select and use appropriate units and tools to measure to the degree of accuracy required in particular measurement situations.</p> <p>2.3.11 B Measure and compare angles in degrees and radians.</p> <p>2.10.11 A Use graphing calculators to display periodic and circular functions; describe properties of the graphs.</p> <p>2.10.11 B Identify, create and solve practical problems involving right triangles using the trigonometric functions and the Pythagorean Theorem.</p>	<p>Angles and Their Measures</p> <p>Trigonometric Functions of Acute Angles</p>	<ul style="list-style-type: none"> -Lecture and Demonstration -Question and Answer -Brainstorming -Discussion -Journal -Cooperative Learning -Exercises -Practice and Application 	<ul style="list-style-type: none"> -Textbook- Precalculus, Graphical, Numerical, Algebraic Addison Wesley Longman Inc. 2001, -Teacher Generated Materials -Calculator Applications -Computer Applications -Internet-Based Applications 	<ul style="list-style-type: none"> -Homework -Tests -Quizzes -Projects

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Trigonometric Functions

Instructional Time: 800minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
2.10.11 A Use graphing calculators to display periodic and circular functions; describe properties of the graphs	The Circular Functions			
2.10.11 A Use graphing calculators to display periodic and circular functions; describe properties of the graphs	Graphs of Trigonometry Functions			
2.10.11 A Use graphing calculators to display periodic and circular functions; describe properties of the graphs. 2.10.11 B Identify, create and solve practical problems involving right triangles using the trigonometric functions and the Pythagorean Theorem.	Inverse Trigonometry Functions and Applications			

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Analytic Trigonometry

Instructional Time: 800minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
<p>2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic). 2.8.11 T Analyze and categorize functions by their characteristics.</p> <p>2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic). 2.4.11 A Use direct proofs, indirect proofs or proof by contradiction to validate conjectures.</p>	<p>Fundamental Identities</p> <p>Proving Trigonometric Identities</p>	<ul style="list-style-type: none"> -Lecture and Demonstration -Question and Answer -Brainstorming -Discussion -Journal -Cooperative Learning -Exercises -Practice and Application 	<ul style="list-style-type: none"> -Textbook- Precalculus, Graphical, Numerical, Algebraic Addison Wesley Longman Inc. 2001, -Teacher Generated Materials -Calculator Applications -Computer Applications -Internet-Based Applications 	<ul style="list-style-type: none"> -Homework -Tests -Quizzes -Projects

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Analytic Trigonometry

Instructional Time: 800minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic). 2.8.11 T Analyze and categorize functions by their characteristics.	Sum and Differences Identities			
2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic). 2.8.11 T Analyze and categorize functions by their characteristics.	Multiple-Angle Identities			
2.9.11 G Solve problems using analytic geometry.	Law of Sines and Cosines			

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Parametric Equations and Polar Equations

Instructional Time: 500minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
<p>2.8.11 S Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).</p> <p>2.8.11 T Analyze and categorize functions by their characteristics.</p> <p>2.8.11 J Demonstrate the connection between algebraic equations and inequalities and the geometry of relations in the coordinate plane.</p> <p>2.8.11 Q Represent functional relationships in tables, charts and graphs.</p>	<p>Parametric Equations</p> <p>Polar Coordinates</p> <p>Graphs of Polar Equations</p>	<ul style="list-style-type: none"> -Lecture and Demonstration -Question and Answer -Brainstorming -Discussion -Journal -Cooperative Learning -Exercises -Practice and Application 	<ul style="list-style-type: none"> -Textbook- Precalculus, Graphical, Numerical, Algebraic Addison Wesley Longman Inc. 2001, -Teacher Generated Materials -Calculator Applications -Computer Applications -Internet-Based Applications 	<ul style="list-style-type: none"> -Homework -Tests -Quizzes -Projects

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Systems and Matrices

Instructional Time: 800minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
<p>2.8.11 D Formulate expressions, equations, inequalities, systems of equations, systems of inequalities and matrices to model routine and non-routine problem situations.</p> <p>2.8.11 F Identify whether systems of equations and inequalities are consistent or inconsistent.</p> <p>2.8.11 G Analyze and explain systems of equations, systems of inequalities and matrices.</p> <p>2.8.11 H Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.</p>	<p>Solving Systems of Two Equations</p>	<ul style="list-style-type: none"> -Lecture and Demonstration -Question and Answer -Brainstorming -Discussion -Journal -Cooperative Learning -Exercises -Practice and Application 	<ul style="list-style-type: none"> -Textbook- Precalculus, Graphical, Numerical, Algebraic Addison Wesley Longman Inc. 2001, -Teacher Generated Materials -Calculator Applications -Computer Applications -Internet-Based Applications 	<ul style="list-style-type: none"> -Homework -Tests -Quizzes -Projects

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Analytic Geometry in Two and Three Dimensions

Instructional Time: 400minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
<p>2.8.11 E Use equations to represent curves (e.g., lines, circles, ellipses, parabolas, hyperbolas). 2.8.11 J Demonstrate the connection between algebraic equations and inequalities and the geometry of relations in the coordinate plane.</p> <p>2.8.11 E Use equations to represent curves (e.g., lines, circles, ellipses, parabolas, hyperbolas). 2.8.11 J Demonstrate the connection between algebraic equations and inequalities and the geometry of relations in the coordinate plane.</p>	<p>Conic Sections and Parabolas</p> <p>Ellipses</p>	<ul style="list-style-type: none"> -Lecture and Demonstration -Question and Answer -Brainstorming -Discussion -Journal -Cooperative Learning -Exercises -Practice and Application 	<ul style="list-style-type: none"> -Textbook- Precalculus, Graphical, Numerical, Algebraic Addison Wesley Longman Inc. 2001, -Teacher Generated Materials -Calculator Applications -Computer Applications -Internet-Based Applications 	<ul style="list-style-type: none"> -Homework -Tests -Quizzes -Projects

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Discrete Mathematics

Instructional Time: 400minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
<p>2.8.11 T Analyze and categorize functions by their characteristics.</p> <p>2.8.11 T. Analyze and categorize functions by their characteristics.</p> <p>2.7.11 A Compare odds and probability.</p> <p>2.7.11 B Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.</p> <p>2.7.11 C. Draw and justify a conclusion regarding the validity of a probability or statistical argument.</p>	<p>Basic Combinations</p> <p>The Binomial Theorem</p> <p>Probability</p>	<p>-Lecture and Demonstration</p> <p>-Question and Answer</p> <p>-Brainstorming</p> <p>-Discussion</p> <p>-Journal</p> <p>-Cooperative Learning</p> <p>-Exercises</p> <p>-Practice and Application</p>	<p>-Textbook- Precalculus, Graphical, Numerical, Algebraic Addison Wesley Longman Inc. 2001,</p> <p>-Teacher Generated Materials</p> <p>-Calculator Applications</p> <p>-Computer Applications</p> <p>-Internet-Based Applications</p>	<p>-Homework</p> <p>-Tests</p> <p>-Quizzes</p> <p>-Projects</p>

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Discrete Mathematics

Instructional Time: 400minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
2.11.11.D Determine sums of finite sequences of numbers and infinite geometric series. 2.11.11.D Determine sums of finite sequences of numbers and infinite geometric series.	Sequence and Series Mathematical Induction			

TUNKHANNOCK AREA SCHOOL DISTRICT

Course: Honors Precalculus

Grade Level: 11

Unit of Study: Limits Derivatives and Integrals

Instructional Time: 300minutes

Anchor & Academic Standard (Eligible Content)	Content	Teaching Method(s)	Materials & Resources	Assessment
<p>2.11.11 A Determine maximum and minimum values of a function over a specified interval.</p> <p>2.11.11 B Interpret maximum and minimum values in problem situations.</p>	<p>Limits and Motion</p> <p>Numerical Derivatives and Integrals</p>	<ul style="list-style-type: none"> -Lecture and Demonstration -Question and Answer -Brainstorming -Discussion -Journal -Cooperative Learning -Exercises -Practice and Application 	<ul style="list-style-type: none"> -Textbook- Precalculus, Graphical, Numerical, Algebraic Addison Wesley Longman Inc. 2001, -Teacher Generated Materials -Calculator Applications -Computer Applications -Internet-Based Applications 	<ul style="list-style-type: none"> -Homework -Tests -Quizzes -Projects