Northside Christian Academy
Curriculum Guide

Subject: Algebra I Grade(s): 8/9

Philosophy Statement
Mathematics develops a student's understanding of God's orderly nature and character. Since we have been commanded as His creation to subdue the earth and have dominion over it (Genesis 1:28), our approach to the created world must be in an ordered and sequential manner. The study of mathematics enables God's creation to better understand the order with which He made the universe and everything in it.

Course Description
This course will help the student to organize his thoughts to solve mathematical problems that he will meet in his everyday life. It will prepare him to continue his studies in mathematics and the sciences. The topics covered include real numbers, solving equations, factoring, problem solving, applying fractions, functions, systems of equations, inequalities, rational and irrational numbers, and quadratic equations.

General Course Goals
- Review the terminology and operations of basic algebra.
- Review solving equations and word problems.
- Perform basic math operations with polynomials.
- Factor polynomials and apply to problem-solving.
- Evaluate fractions and apply to problems.
- Define and analyze graphs and functions.
- Solve linear equations and inequalities.
- Define and evaluate expressions with square roots.
- Solve quadratic equations.

Text(s)/Class Resources
- *Algebra 1:* McDougal Littell
- Teacher resource file from publisher
- TI-36X Scientific Calculator (If a graphing calculator is preferred, a TI-83+ or equivalent is acceptable)

Time Allotment
- One 45 minute class per day, 5 times per week
- Course length: two semesters

Assessment
- One test per unit with partial chapter quizzes (1 – 3 per unit)
- One cumulative exam per semester
- One notebook grade (quiz) per quarter
- Homework checked as assigned (will be graded on either completeness or correctness)

Northside Christian Academy
Curriculum Guide

Subject: Geometry Grade(s): 10/9

Philosophy Statement
Here at Northside Christian Academy, mathematics develops a student's understanding of God's orderly nature and character. God has given us the responsibility to subdue the earth and have dominion over His creation, (Genesis 1:28), our approach to the created world must be in an ordered and sequential manner. The study of mathematics enables God's creation to better understand the order with which He made the universe and everything in it.

Course Description
This is a college prep course. It is required for admission by most colleges and is tested extensively on college entrance exams. Therefore, students who plan on going to college, and only those students, should take geometry. Students will learn basic terms and fundamental relationships with an emphasis on problem solving. Proofs will be studied but not emphasized. Topics covered include properties and definitions of points, lines, planes, angles, parallel lines and planes, congruent, similar and right triangles, congruent and similar polygons, circles and areas of plane figures. Students will use a compass and straightedge to do geometric constructions and a protractor to measure angles. A scientific calculator is required. Prerequisite: Algebra 1

General Course Goals
- Basic geometric figures (points, lines, planes, and angles)
- Deductive reasoning (logic, intro. to proofs, perpendicular lines)
- Parallel lines and planes (angles of triangles and polygons, inductive reasoning)
- Properties of and proving triangles congruent
- Properties of parallelograms and other 'special' quadrilaterals
- Indirect proof and use of inequalities
- Set up of ratio and proportion with and without similar geometric figures
- Relate previous relationships to right triangles (and trigonometric ratios)
- Terms and properties or circles, arcs, and chords
- Demonstrate competency with constructions and loci (in two dimensions primarily)
- Find areas of plane figures and identify needed formulae

Text(s)/Class Resources
- *Geometry*, McDougal Littell
- TI-36X Scientific Calculator (If a graphing calculator is preferred, a TI-83+ or equivalent is acceptable)

Time Allotment
- One 45 minute class per day, 5 times per week
- Course length: two semesters

Assessment
- One test per unit (minimum) with inclusion of partial chapter quizzes as needed
- One cumulative exam per semester
- One notebook grade (quiz) per quarter
- Homework checked as assigned (will be graded on either "attempted/completed" or "correctness" ~ will vary)

Northside Christian Academy
Curriculum Guide

Subject: Honors Geometry Grade(s): 10/9

Philosophy Statement
Here at Northside Christian Academy, mathematics develops a student's understanding of God's orderly nature and character. God has given us the responsibility to subdue the earth and have dominion over His creation, (Genesis 1:28), our approach to the created world must be in an ordered and sequential manner. The study of mathematics enables God's creation to better understand the order with which He made the universe and everything in it.

Course Description
This is a more advanced geometry course for those in the honors math track. Students will learn basic terms and fundamental relationships with an emphasis on problem solving and more of an emphasis on proofs. Topics covered include properties and definitions of points, lines, planes, angles, parallel lines and planes, congruent, similar and right triangles, congruent and similar polygons, circles and areas of plane figures, areas and volumes of solids, coordinate geometry. Students will use a compass and straightedge to do geometric constructions and a protractor to measure angles. A scientific calculator is required. Prerequisite: Algebra 1 and additional criteria for selection to the honors course.

General Course Goals
- Basic geometric figures (points, lines, planes, and angles)
- Deductive reasoning (logic, intro. to proofs, perpendicular lines)
- Parallel lines and planes (angles of triangles and polygons, inductive reasoning)
- Properties of and proving triangles congruent
- Properties of parallelograms and other 'special' quadrilaterals
- Indirect proof and use of inequalities
- Set up of ratio and proportion with and without similar geometric figures
- Relate previous relationships to right triangles (and trigonometric ratios)
- Terms and properties or circles, arcs, and chords
- Demonstrate competency with constructions and loci (in two dimensions primarily)
- Find areas of plane figures and identify needed formulae
- Find areas and volumes of solids, including spheres
- Use coordinate geometry to find distances, slopes, and midpoints

Text(s)/Class Resources
- *Geometry*, McDougal Littell
- TI-36X Scientific Calculator (If a graphing calculator is preferred, a TI-83+ or equivalent is acceptable)

Time Allotment
- One 45 minute class per day, 5 times per week
- Course length: two semesters

Assessment
- One test per unit (minimum) with inclusion of partial chapter quizzes as needed
- One cumulative exam per semester
- One notebook grade (quiz) per quarter
- Homework checked as assigned (will be graded on either "attempted/completed" or "correctness" ~ will vary)

Northside Christian Academy
Curriculum Guide

Subject: Algebra II Grade(s): 11

Philosophy Statement
Mathematics develops a student's understanding of God's orderly nature and character. Since we have been commanded as His creation to subdue the earth and have dominion over it (Genesis 1:28), our approach to the created world must be in an ordered and sequential manner. The study of mathematics enables God's creation to better understand the order with which He made the universe and everything in it.

Course Description
This college-prep course is required for graduation. The course reviews and builds on topics covered in Algebra I. Topics include solving linear and quadratic equations and linear inequalities, graphing techniques, polynomials, factoring, irrational and complex numbers, systems of equations, functions, conic sections, exponential and logarithmic functions, statistics and probability. Prerequisite: Algebra I

General Course Goals
- Review the terminology and operations of basic algebra including solving equations and word problems.
- Solve inequalities and illustrate them by graphing.
- Solve and graph linear equations and functions and apply them to solving problems.
- Apply basic algebra operations to polynomials.
- Evaluate and simplify rational expressions.
- Identify and solve irrational and complex numbers.
- Solve and apply quadratic equations and functions.
- Review variation and evaluate polynomial equations.
- Connect algebra with geometry through problem solving.
- Define and solve exponential and logarithmic functions.
- Define interpret and apply statistics and probability.

Text(s)/Class Resources
- *Algebra 2*, McDougal Littell
- Teacher resource file from publisher
- TI-36X Scientific Calculator (If a graphing calculator is preferred, a TI-83+ or equivalent is acceptable)

Time Allotment
- One 45 minute class per day, 5 times per week
- Course length: two semesters

Assessment
- One test per unit with partial chapter quizzes (1 – 3 per unit)
- One cumulative exam per semester
- One notebook grade (quiz) per quarter
- Homework checked as assigned (will be graded on either completeness or correctness)

Northside Christian Academy
Curriculum Guide

Subject: Honors Algebra II Grade(s): 10/11

Philosophy Statement
Mathematics develops a student's understanding of God's orderly nature and character. Since we have been commanded as His creation to subdue the earth and have dominion over it (Genesis 1:28), our approach to the created world must be in an ordered and sequential manner. The study of mathematics enables God's creation to better understand the order with which He made the universe and everything in it.

Course Description
This is a college prep course for the serious math student preparing for higher-level mathematics. Algebra 2 or Algebra 2 Honors is required for graduation. Topics include linear functions and relations, systems of linear equations and inequalities, graphing, determinants, polynomial and rational expressions, radicals and irrational numbers, sequences and series, polynomial functions, conic sections, exponents and logarithms, and statistics and probability. Prerequisite: Algebra I and other criteria for selection to an honors course.

General Course Goals
- Review the terminology and operations of basic algebra including solving equations and word problems.
- Solve inequalities and illustrate them by graphing.
- Solve and graph linear equations and functions and apply them to solving problems.
- Apply basic algebra operations to polynomials.
- Evaluate and simplify rational expressions.
- Identify and solve irrational and complex numbers.
- Solve and apply quadratic equations and functions.
- Review variation and evaluate polynomial equations.
- Connect algebra with geometry through problem solving.
- Define and solve exponential and logarithmic functions.
- Identify and evaluate sequences and series.
- Define interpret and apply statistics and probability.
- Identify and utilize basic matrix algebra concepts.

Text(s)/Class Resources
- *Algebra 2*, McDougal Littell, 2007 [ISBN: 0-618-59541-4]
- Easy Planner DVD-ROM from publisher
- Scientific Calculator (TI-30 is recommended)

Time Allotment
- One 45 minute class per day, 5 times per week
- Course length: two semesters

Assessment
- One test per unit with partial chapter quizzes (1 – 3 per unit)
- One cumulative exam per semester
- One notebook grade (quiz) per quarter
- Homework checked as assigned (will be graded on either completeness or correctness)

Northside Christian Academy
Curriculum Guide

Subject: Advanced Functions and Modeling Grade: 12

Philosophy Statement
Here at Northside Christian Academy, mathematics develops a student's understanding of God's orderly nature and character. God has given us the responsibility to subdue the earth and have dominion over His creation, (Genesis 1:28), our approach to the created world must be in an ordered and sequential manner. The study of mathematics enables God's creation to better understand the order with which He made the universe and everything in it.

Course Description
This college-prep course reviews the topics of Algebra 2 and Geometry and continues the study of advanced algebra concepts including sequences and series, conic sections, variation and polynomial equations, exponential and logarithmic functions, trigonometry, and probability and statistics. "Real World" applications will be included and some 'hands on' and manipulatives will be used. This course is one option for meeting the graduation requirement of a math course beyond Algebra 2.

General Course Goals
- Univariate data, data collection and analysis
- Probability
- Logarithmic / Exponential Functions
- Piecewise Functions
- Power (exponent) and Polynomial Functions
- Trigonometric Functions
- Recursively – defined Functions
- Graphing Exponential Functions
- Parametric Equations
- Linear Programming

Text(s)/Class Resources
- *Advanced Mathematics: Precalculus with Discrete Mathematics and Data Analysis*, Houghton Mifflin
- TI-83+ Plus calculator and/or TI-36X {the graphing calculator will be useful, but the scientific will work for most of the applications in the class}
- Supplemental materials from the state of North Carolina "AFM" curriculum guide will be used.

Time Allotment
- One 45 minute class per day, 5 times per week
- Course length: two semesters

Assessment
- One test per unit and 'interim' quizzes, as needed within each unit
- One cumulative exam at the end of the 1st semester, One final exam at the end of the year, as needed
- One notebook grade (quiz) per quarter
- Homework checked as assigned

Northside Christian Academy
Curriculum Guide

Subject: Pre-Calculus Honors Grade(s): 11/12

Philosophy Statement
Mathematics develops a student's understanding of God's orderly nature and character. Since we have been commanded as His creation to subdue the earth and have dominion over it (Genesis 1:28), our approach to the created world must be in an ordered and sequential manner. The study of mathematics enables God's creation to better understand the order with which He made the universe and everything in it.

Course Description
This course is designed to review the basic algebra facts such as lines, graphs, midpoint and quadratic formulas, graphing lines and parabolas and solving systems of equations. The course builds and expands on these topics in the first semester. Second semester deals with topics in Trigonometry including radian measure, polar coordinates, vectors, and matrices. An introduction to derivatives and integration is also taught during the second semester. This course is one option for meeting the graduation requirement of a math course beyond Algebra 2. However, it is an honors course, so it carries the prerequisite of Algebra 2 or Algebra 2 Honors and additional criteria for selection to an honors course.

General Course Goals
- Solve linear and quadratic functions
- Solve polynomial functions
- Solve inequalities
- Use functions
- Use exponents and logarithms
- Solve problems in analytic geometry
- Solve trigonometric functions
- Apply trigonometric equations
- Solve triangle trigonometry
- Solve Trigonometric addition formulas
- Solve problems with polar coordinates and complex numbers
- Use vectors and determinants
- Use sequences and series
- Use matrices
- Solve combinatorics
- Solve probability
- Solve statistics

Text(s)/Class Resources
- *Precalculus: Graphical, Numerical, Algebraic*, Prentice Hall
- Teacher Resource File from publisher
- TI-83 calculator

Time Allotment
- One 45 minute class per day, 5 times per week
- Course length: two semesters

Assessment

- One quiz and one test per unit
- One cumulative exam

Homework checked as assigned

Northside Christian Academy
Curriculum Guide

Subject: Calculus AP Grade(s): 11/12

Philosophy Statement
Mathematics develops a student's understanding of God's orderly nature and character. Since we have been commanded as His creation to subdue the earth and have dominion over it (Genesis 1:28), our approach to the created world must be in an ordered and sequential manner. The study of mathematics enables God's creation to better understand the order with which He made the universe and everything in it.

Course Description
This course is designed to introduce students to the study of Calculus. Understanding of Differential and Integral Calculus will include finding slopes of lines, areas under curves, related rates, and applications to Physics and business. It is an Advanced Placement course, so all students are required to take the national AP exam in May. Prerequisite: Precalculus and additional criteria for selection to an AP course.

General Course Goals
- Know how to solve functions and models
- Know how to solve limits and derivatives
- Know rules of differentiation
- Apply differentiation
- Solve integrals
- Apply integration
- Solve differential equations
- Solve sequences and series

Text(s)/Class Resources
- *Calculus Graphical, Numerical, Algebraic* Prentice Hall
- Teacher Solutions guide from publisher
- TI-83+ calculator

Time Allotment
- One 45 minute class per day, 5 times per week
- Course length: two semesters

Assessment
- One test per 3 weeks of study
- One cumulative exam
- Homework checked as assigned