Tenth Grade Curriculum

Rhetoric Math Offerings:

Geometry:

I. Points, Lines, Planes and Angles
   A. Some Basic Figures
   B. Definitions and Postulates

II. Deductive Reasoning
   A. Using Deductive Reasoning
   B. Theorems about Angles and Perpendicular Lines

III. Parallel Lines and Planes
   A. When Lines and Planes are Parallel
   B. Applying Parallel Lines to Polygons

IV. Congruent Triangles
   A. Corresponding Parts in Congruence
   B. Some Theorems Based on Congruent Triangles
   C. More about Proof in Geometry

V. Quadrilaterals
   A. Parallelograms
   B. Special Quadrilaterals

VI. Inequalities in Geometry
   A. Inequalities and Indirect Proof
   B. Inequalities and Triangles

VII. Similar Polygons
    A. Ratio, Proportion and Similarity
    B. Working with Similar Triangles

VIII. Right Triangles
      A. Right Triangles
      B. Trigonometry

IX. Circles
    A. Tangents, Arcs, and Chords
    B. Angles and Segments

X. Constructions and Loci
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A. Basic Constructions
B. More Constructions
C. Locus

XI. Areas of Plane Figures
A. Areas of Polygons
B. Circles, Similar Figures and Geometric Probability

XII. Areas and Volumes of Solids
A. Important Solid
B. Similar Solid

XIII. Coordinate Geometry
A. Geometry and Algebra
B. Lines and Coordinate Geometry Proofs

XIV. Transformations
A. Some Basic Mappings
B. Composition and Symmetry

Algebra II and Trigonometry:

I. Basic Concepts of Algebra
A. The Language of Algebra
B. Operating with Real Numbers
C. Solving Equations and Solving Problems

II. Inequalities and Proof
A. Working with Inequalities
B. Working with Absolute Value
C. Proving Theorems

III. Linear Equations and Functions
A. Linear Equations and Their Graphs
B. Linear System
C. Functions and Relations

IV. Products and Factors of Polynomials
A. Working with Polynomials
B. Factors of Polynomials
C. Applications of Factoring

V. Rational Expressions
A. Using the Laws of Exponents
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B. Rational Expressions
C. Problem Solving Using Fractional Equations

VI. Irrational and Complex Numbers
   A. Roots and Radicals
   B. Real Numbers and Complex Numbers

VII. Quadratic Equations and Functions
   A. Solving Quadratic Equations
   B. Roots of Quadratic Equations
   C. Quadratic Functions and Their Graphs

VIII. Variation and Polynomial Equations
   A. Variation and Proportion
   B. Polynomial Equations
   C. Solving Polynomial Equations

IX. Analytic Geometry
   A. Conic Sections: Circles and Parabolas
   B. Conic Sections: Ellipses and Hyperbolas
   C. Systems of Equations

X. Exponential and Logarithmic Functions
   A. Exponential Functions
   B. Logarithmic Functions
   C. Applications

XI. Sequences and Series
   A. Sequences
   B. Series
   C. Binomial Expansions

XII. Triangle Trigonometry
    A. Trigonometric Functions
    B. Triangle Trigonometry

XIII. Trigonometric Graphs; Identities
    A. Circular Functions and Their Graphs
    B. Trigonometric Identities

XIV. Trigonometric Applications
    A. Vectors
    B. Polar Coordinates and Complex Numbers
    C. Inverse Functions

XV. Statistics and Probability
    A. Statistics
    B. Counting
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C. Probability

XVI. Matrices and Determinants
   A. Matrices
   B. Inverses of Matrices
   C. Working with Determinants

Statistics and Probability:

I. Interpreting Categorical and Quantitative Data
   A. Summarize, represent, and interpret data on a single count or measurement variable
   B. Summarize, represent, and interpret data on two categorical and quantitative variables
   C. Interpret linear models

II. Making Inferences and Justifying Conclusions
   A. Understand and evaluate random processes underlying statistical experiments
   B. Make inferences and justify conclusions from sample surveys, experiments and observational studies

III. Conditional Probability and the Rules of Probability
   A. Understand independence and conditional probability and use them to interpret data
   B. Use the rules of probability to compute probabilities of compound events in a uniform probability model

IV. Using Probability to Make Decisions
   A. Calculate expected values and use them to solve problems
   B. Use probability to evaluate outcomes of decisions

Pre-Calculus:

I. Linear and Quadratic Functions
   A. Points and Lines
   B. Slopes of Lines
   C. Finding Equations of Lines
   D. Linear Functions and Models
   E. Complex Numbers
   F. Solving Quadratic Equations
   G. Quadratic Functions and their Graphs

II. Polynomial Functions
   A. Polynomials
B. Synthetic Division; Remainder and Factor Theorems
C. Graphing Polynomial Functions
D. Finding Maximums and Minimums
E. Using Technology To Approximate Roots
F. Solving Polynomial Equations by Factoring
G. General Results for Polynomial Equations

III. Inequalities
A. Linear Inequalities; Absolute Value
B. Polynomial Inequalities in One Variable
C. Polynomial Inequalities in Two Variable
D. Linear Programming

IV. Functions
A. Functions
B. Operations on Functions
C. Reflecting Graphs; Symmetry
D. Period Functions; Stretching and Translating Graphs
E. Inverse Functions

V. Exponents and Logarithms
A. Growth and Decay: Integral Exponents
B. Growth and Decay: Rational Exponents
C. Exponential Functions
D. The Number e and the Function \( e^x \)
E. Logarithmic Functions
F. Laws of Logarithms
G. Exponential Equations; Change of Base

VI. Trigonometric Functions
A. Measurement of Angles
B. Sectors of Circles
C. Sine and Cosine Functions
D. Evaluating and Graphing Sine and Cosine
E. The Other Trigonometric Functions
F. The Inverse Trigonometric Functions

VII. Trigonometric Functions and Applications
A. Simple Trigonometric Equations
B. Sine and Cosine Curves
C. Modeling Periodic Behavior
D. Relationships among the Functions
E. Solving More Difficult Trigonometric Equations

VIII. Triangle Trigonometry
A. Solving Right Triangles
B. Area of a Triangle
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C. Law of Sines
D. Law of Cosines
E. Applications of Trigonometry

IX. Trigonometric Addition Formulas
   A. Sum and Difference Formulas: Sine and Cosine
   B. Sum and Difference Formulas: Tangent
   C. Double-Angle and Half-Angle Formulas
   D. Solving Trigonometric Equations

X. Polar Coordinates
   A. Polar Coordinates and Graphs
   B. Geometric Representation of Complex Numbers
   C. Powers of Complex Numbers
   D. Roots of Complex Numbers

XI. Sequences and Series
   A. Arithmetic and Geometric Sequences
   B. Recursive Definitions
   C. Arithmetic and Geometric Series and their Sums
   D. Limits of Infinite Sequences
   E. Sums of Infinite Geometric Series
   F. Sigma Notation

XII. Limits
    A. Limits of Functions

XIII. Introduction to Calculus
    A. Slope of a Curve
    B. Using Derivatives in Curve Sketching
    C. Velocity and Acceleration
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Science: Chemistry

I. Introduction to Chemistry
   A. Laboratory Safety and Skills
   B. Scientific Inquiry: Measurement/Data

II. Atomic Structure
   A. Atomic Structure: Elements
   B. Isotopes
   C. Radioactive Decay and Half Life

III. Properties of Matter
   A. Heat Transfer and Heat Capacity
   B. Molar Heat of Fusion for Water
   C. The Colligative Properties of Solutions

IV. Electron Configuration and the Periodic Table
   A. Element Family
   B. Atomic Structure: Periodic Table

V. Bonding, Nomenclature, and Formula Writing
   A. Properties of Compounds and Chemical Formulas
   B. Molecular Model
   C. Matter and Energy: Equations and Formulas

VI. Chemical Reactions and Equations
   A. Predicting Products and Writing Equations
   B. Chemical Reactions
   C. Equilibrium and Le Chatelier’s Principle

VII. Stoichiometry
   A. Formula and Percent Composition of Ionic Compound

VIII. Kinetic Theory
   A. States of Matter
   B. Vapor Pressure and Colligative Properties

IX. Acids, Bases, and Electrolytes
   A. Study of Acids and Bases
   B. Acid-Base Theory

Humane Letters: History, Literature and Composition, Philosophy, and Theology

I. History
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A. Text: Western Civilization, Spielvogel
   1. Late Antiquity and the Emergence of the Medieval World
      a. The Late Roman Empire
      b. The Germanic Kingdoms
      c. Development of the Christian Church
      d. The Byzantine Empire
      e. The Rise of Islam
   2. European Civilization in the Early Middle Ages
      a. Europeans and the Environment
      b. The World of the Carolingians
      c. Disintegration of the Carolingian Empire
      d. The Emerging World of Lords and Vassals
      e. The Slavic Peoples of Central and Eastern Europe
      f. The Expansion of Islam
   3. The Recovery and Growth of European Society in the High Middle Ages
      a. Land and People in the High Middle Ages
      b. The New World of Trade and Cities
      c. The Intellectual and Artistic World of the High Middle Ages
   4. The Rise of Kingdoms and the Growth of Church Power
      a. The Emergence and Growth of European Kingdoms
      b. The Recovery and Reform of the Catholic Church
      c. Christianity and Medieval Civilization
      d. The Crusades
   5. The Later Middle Ages: Crisis and Disintegration in the Fourteenth Century
      a. A Time of Troubles: Black Death and Social Crisis
      b. War and Political Instability
      c. The Decline of the Church
      d. The Cultural World of the Fourteenth Century
      e. Society in an Age of Adversity
      a. The Making of Renaissance Society
      b. The Italian States in the Renaissance
      c. The Intellectual Renaissance in Italy
      d. The Artistic Renaissance
      e. The European State in the Renaissance
      f. The Church in the Renaissance
   7. Reformation and Religious Warfare in the Sixteenth Century
      a. Prelude to Reformation
      b. Martin Luther and the Reformation in Germany
      c. The Spread of the Protestant Reformation
      d. The Social Impact of Protestant Reformation
      e. Politics and Wars of Religion in the Sixteenth Century

B. Additional Texts
   1. The Middle Ages, Mills
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II. Literature and Composition
   A. Whole Works
      1. Shakespeare, Julius
      2. Juvenal, Satires I, II, and X
      3. Graves, I, Claudius
      5. Dante, The Inferno
      6. Heaney, Beowulf
      7. Song of Roland (Dorothy Sayers ed.)
      8. Cervantes, Don Quixote (abridged)
      9. Shakespeare, Merchant of Venice
     10. Boroff, Sir Gawain and the Green Knight
     11. Rabelais, Gargantua and Pantagruel, books 1 and 2
     12. Marlowe, Faustus
     13. Shakespeare, Hamlet
     14. Shaw, Saint Joan
     15. Eliot, Murder in the Cathedral
     16. Pirandello, Henry IV
     17. Brecht, Galileo
     18. Cohen, Teresa of Avila, The Life of Saint Theresa of Avila by Herself
   B. Selections
      1. Livy
      2. Selections from Tacitus
      3. Virgil, The Aeneid (selections)
      4. Malory, Le Morte d'Arthur (selections)
      5. Cellini, Autobiography (selections)
      6. Chaucer, The Canterbury Tales (selections)
      7. Spenser, Faerie Queene
      8. Reade, The Cloister and the Hearth
   C. Grammar Texts
      1. The Magic Lens Volume III
      2. The Word Within the Word Volume III
      3. Poetry, Plato and the Problem of Truth
      4. Advanced Academic Writing Volume III
      5. 4 Practice Volume III

III. Philosophy
   A. Boethius, The Consolation of Philosophy
   B. Machiavelli, The Prince
   C. Erasmus, Education of A Christian Prince (selections)
   D. More, Utopia
   E. Pico, “Oration on the Dignity of Man”
   F. Montaigne, Essays (selections)
   G. Erasmus, Colloquies (selections)
   H. Aristotle’s Ethics and Politics
IV. Theology
   A. Acts of the Apostles
   B. Stott, *Basic Christianity*
   C. The Gospel According to Saint John
   D. Erasmus and Luther, *Discourse on Free Will, Commentary on Galatians*
   E. Calvin, *Institutes of the Christian Religion* (selections)
   F. Saint Augustine, *Confessions, City of God*
   G. Aquinas, Thomas, Selected Writings
   H. Selections from Apostolic Fathers

V. Research Paper Project:
   A. Discuss the social, political, economic, or cultural impact of the Crusades on Western Europe in 3,000 to 5,000 words. This paper should exhibit a wide reading, as well as an ability to narrow down a large topic and argue a thesis clearly and convincingly. Each student’s respective teacher acts as his advisor on this project.

VI. Memory
   A. St. Matthew 5:3-12, “The Beatitudes”
   B. St. John 1:1-5, “The Word”
   C. 1 Corinthians 13, “The Greatest of These”
   D. Shakespeare, “The quality of mercy is not strained” from the Merchant of Venice”
   E. Shakespeare, “To be, or not to be: that is the questions” from Hamlet
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Ancient Greek II:

I. Vocabulary
   A. 300 words memorized
   B. Study of English derivatives

II. Grammar & Memorization
   A. Aspect: continuous, aorist, perfect
   B. Tense: past, present, future
   C. Verb stems: all tenses, all aspects
   D. Voice: active, passive, middle
   E. Indirect discourse
   F. Genitive absolute & passive periphrastic
   G. Imperatives
   H. Uses of Subjunctive: hortatory, deliberative, prohibition, purpose, fearing
   I. Perfect as Present
   J. Optative
   K. Middle Voice: Indicative Middle, Perfect Middle, Middle Imperatives
   L. Deponent verbs
   M. Verbals

III. Memory: Selections from Original Texts
   A. New Testament verses
   B. Poetry and quotations of Sappho, Heraclitus, and Diogene
   C. Hecuba’s Speech from Trojan Women, Euripides

IV. Text
   A. Ancient Greek Alive, Paula Saffire and Catherine Freis