Analytic Geometry Course Syllabus

DeKalb Early College Academy

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Semester: 1st - 2014-15	**Tutorial Location**: Room C-9
Textbook: Georgia Analytic Geometry Replacement cost of textbook: TBD	**Tutorial Days and Hours**: Tuesday through Friday (7:30 – 8:05) Available upon appointment on selected afternoons

Department Philosophy: We believe that by creating an environment conducive to learning, building positive rapport with students, and employing differentiated instructional strategies, we can promote student success. Furthermore we believe that each student can be successful in learning to: value mathematics, become a mathematical problem solver, communicate and reason mathematically.

Course Description: This course is mainly devoted to plane Euclidean geometry, studied both synthetically (without coordinates) and analytically (with coordinates). Dynamic geometry environments provide students with experimental and modeling tools that allow them to investigate geometric phenomena in much the same way as computer algebra systems allow them to experiment with algebraic phenomena. It includes among others, concepts of congruence, similarity, transformations (rigid motions followed by dilations), definitions of sine, cosine, and tangent for acute angles and theorems about circles.

Course Prerequisites: *Successful completion of CCGPS Analytic Geometry A*

CCGPS Analytic Geometry Standards

Use complex numbers in polynomial identities and equations.

MCC9-12.N.CN.7 Solve quadratic equations with real coefficients that have complex solutions.

Interpret the structure of expressions

MCC9-12.A.SSE.1 Interpret expressions that represent a quantity in terms of its context.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

MCC9-12.A.SSE.1a Interpret parts of an expression, such as terms, factors, and coefficients.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

MCC9-12.A.SSE.1b Interpret complicated expressions by viewing one or more of their parts as a single entity.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

MCC9-12.A.SSE.2 Use the structure of an expression to identify ways to rewrite it. *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

Write expressions in equivalent forms to solve problems

MCC9-12.A.SSE.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

MCC9-12.A.SSE.3a Factor a quadratic expression to reveal the zeros of the function it defines.★

MCC9-12.A.SSE.3b Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.★

Create equations that describe numbers or relationships

MCC9-12.A.CED.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.★

MCC9-12.A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on

Solve systems of equations

MCC9-12.A.REI.7 Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.

Translate between the geometric description and the equation for a conic section

MCC9-12.G.GPE.1 Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.

MCC9-12.G.GPE.2 Derive the equation of a parabola given a focus and directrix.

Use coordinates to prove simple geometric theorems algebraically

MCC9-12.G.GPE.4 Use coordinates to prove simple geometric theorems algebraically. *(Restrict to context of circles and parabolas)*

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Understand independence and conditional probability and use them to interpret data

MCC9-12.S.CP.1 Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").★

MCC9-12.S.CP.2 Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.★

MCC9-12.S.CP.3 Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.★

MCC9-12.S.CP.4 Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.★

MCC9-12.S.CP.5 Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.★

Use the rules of probability to compute probabilities of compound events in a uniform probability model

MCC9-12.S.CP.6 Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.★

MCC9-12.S.CP.7 Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model.★

coordinate axes with labels and scales.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

MCC9-12.A.CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

Solve equations and inequalities in one variable

MCC9-12.A.REI.4 Solve quadratic equations in one variable.

MCC9-12.A.REI.4a Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.

MCC9-12.A.REI.4b Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.

Solve systems of equations

MCC9-12.A.REI.7 Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.

Interpret functions that arise in applications in terms of the context

MCC9-12.F.IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★

MCC9-12.F.IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

MCC9-12.F.IF.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

Analyze functions using different representations

MCC9-12.F.IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

MCC9-12.F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima.★

MCC9-12.F.IF.8 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

MCC9-12.F.IF.8a Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.

MCC9-12.F.IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

Build a function that models a relationship between two quantities

MCC9-12.F.BF.1 Write a function that describes a relationship between two quantities.★ *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

MCC9-12.F.BF.1a Determine an explicit expression, a recursive process, or steps for calculation from a context. *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

MCC9-12.F.BF.1b Combine standard function types using arithmetic operations. *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

Build new functions from existing functions

MCC9-12.F.BF.3 Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. *(Focus on quadratic functions; compare with linear and exponential functions studied in Coordinate Algebra.)*

Construct and compare linear, quadratic, and exponential models and solve problems

MCC9-12.F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.★

Summarize, represent, and interpret data on two categorical and quantitative variables

MCC9-12.S.ID.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.★

MCC9-12.S.ID.6a Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.★

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2nd Semester – CCGPS Analytic Geometry - At a Glance

Unit 4 Extending the Number System *(continuation from sem. 1)*	**Unit 5** Quadratic Functions ***(6 – 7 weeks)***	**Unit 6** Modeling Geometry ***(4 – 5 weeks)***	**Unit 7** Applications of Probability ***(4 – 5 weeks)***
MCC9-12.N.RN.1 MCC9-12.N.RN.2 MCC9-12.N.RN.3 MCC9-12.N.CN.1 MCC9-12.N.CN.2 MCC9-12.N.CN.3(+) **MCC9-12.A.APR.1**	MCC9-12.N.CN.7 MCC9-12.A.SSE.1a,b MCC9-12.A.SSE.2 MCC9-12.A.SSE.3a,b MCC9-12.A.CED.1 MCC9-12.A.CED.2 MCC9-12.A.CED.4 MCC9-12.A.REI.4a,b MCC9-12.A.REI.7 MCC9-12.F.IF.4 MCC9-12.F.IF.5 MCC9-12.F.IF.6 MCC9-12.F.IF.7a MCC9-12.F.IF.8a MCC9-12.F.IF.9 MCC9-12.F.BF.1a,b MCC9-12.F.BF.3 MCC9-12.F.LE.3 **MCC9-12.S.ID.6a**	**MCC9-12.A.REI.7** **MCC9-12.G.GPE.1** **MCC9-12.G.GPE.2** **MCC9-12.G.GPE.4**	MCC9-12.S.CP.1 MCC9-12.S.CP.2 MCC9-12.S.CP.3 MCC9-12.S.CP.4 MCC9-12.S.CP.5 MCC9-12.S.CP.6 **MCC9-12.S.CP.7**

Grading scale

Homework	10 %
Class work/Daily Work/Performance	10 %
Quizzes/Performance Tasks/Compass (My foundation lab)	20 %
Tests	40 %
EOCT	20 %
TOTAL	**100 %**

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Required Materials:
1 ream of white copy paper to copy COMPASS practice tests, daily class notes, and other resource materials for students to take home. Students will bring textbook, magic markers, spiral notebook, composition book, pencil, lined paper, graph paper, scientific/ graphing calculator, straightedge, compass and a protractor daily.

Wish List Items:
Colored markers will be used frequently throughout this course it is suggested that each student bring colors of his or her choice.

Course Procedures
Work Requirement: A heading should be in the upper right-hand corner of the page and should consist of the following:

- First and last name
- Date
- Course name and period number
- Textbook page number and assignment numbers OR the name of assignment
- On assignments, students must write in complete sentences when necessary!!
- Must Show ALL work in order to receive credit

Interactive Notebooks: The purpose of the interactive notebook is to enable students to be creative, independent thinkers and writers. Interactive notebooks are used for class notes as well as for other activities where the student will be asked to express his/her own ideas and process the information presented in class. This notebook will count as a final project grade and be used simultaneously to prepare for the Math 1 End-of-Course Test.

1) **A title page for the notebook** - right side, containing the title of the course, students name, teachers name, class period, and symbols or pictures related to the course.
2) **Taped or Glued in Handouts** - handouts kept in order and in such a way that a student can refer to them. Can be folder or the edges cut so they don't stick out.
3) **Title page for each unit** - containing the title of the unit and some relevant pictures and or symbols
4) **A table of contents or Index** - List the name of the activity, and the page. **Date all work**

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Classroom Expectations:

BE PRESENT AND ON TIME

- Attend Class daily
- Tardy students must bring a pass.

BE PREPARED

- Bring all materials daily.
- Have homework completed.
- Get your desk ready by the time the bell rings.
- Be in your seat ready when the bell rings.

BE A COURTEOUS, QUIET LISTENER

- No loud, unnecessary talking or noise making.

BE PROACTIVE

- Follow directions the first time they are given.
- Maintain a clean, safe classroom environment; food, candy and chewing gum, and grooming are NOT permitted. Water in a clear plastic container is allowed.
- Seek help when faced with difficulty. Tutoring is available.
- Ask for all work missed.
- Make restroom stops before and after class.
- When the bell rings wait to be dismissed.

BE COOPERATIVE AND RESPECTFUL

- Respect all teachers and students.
- We must work together to succeed; it is not the right of an individual student to take way from the educational time of others.
- Cultivate a positive attitude that supports your own learning, as well as that of others. Remember attitude is everything.

- EXPECT EVERY STUDENT TO SUCCESFULLY COMPLETE THE COURSE TO THE BEST OF HIS/HER ABILITY. ABOVE ALL, don't ever give up.

Late Assignments:

Class work may be turned in only for the current grading period. There will be a 10 % deduction for late performance and classwork assignments.

Make-up Policy:

1. Upon returning to school from an excused absence, a student has as many days to make up work as he or she was absent.
2. If a student is absent on the day of a quiz, test or notebook check that assessment can only be made up if the absence is **EXCUSED**. Make up tests are administered either before or after school on the appropriate make-up test date. Failure to show up for a makeup test will result in a zero.

Re-do Policy

Anything concerning re-doing assignments is at the teacher's discretion. The assignments must be full-effort work that is submitted on time. **TESTS and Quizzes** may be redone at the students request and schedule **DURING MORNING TUTORIAL TIME**. Whatever grade the student receives on the make-up test is the score that will be entered into the student's grade report.

Performance Grades:

Performance grades are based upon each student's contribution to the class. Attitudes and behaviors that merit a positive grade include raising hands before speaking, positive attitude, quality group work (contributing to the finished product) remaining alert and focused, being quiet during instruction, etc. Behaviors that merit a lower performance grade include talking during instruction, arguing with the teacher, not putting forth your best effort, sleeping in class, unexcused tardiness, being unprepared with homework assignments, etc.

Cooperative Groups:
Each scholar will be assigned to a group of three or four members with whom they will work closely during the semester. Group members will change at the teacher's discretion. Group responsibilities include participation in discussions, reviewing homework in the first 10-15 minutes of class, and making sure each member can explain and present any homework problem that has been assigned. **No group grades are given.** The cooperative group strategy is only used to encourage students to interact by discussing mathematical strategies and to help develop teamwork skills.

COMPASS TEST: The compass test is the college placement test that all entering freshmen are required to take before entry into college. A minimum passing grade is 37. This grade allows the scholar to enter the duel enrollment process between DECA and GPC. A grade below 37 may require the scholar to remain at DECA until more skill is acquired and then, upon re-take, a new decision about duel enrollment will follow.

Grades between 37 and 57 will require discussion between faculty, administration and each individual scholar about proper placement into pre-requisite courses at Georgia Perimeter College. A grade of 64 or better will allow the opportunity for scholars to show knowledge of Trigonometry, a pre-requisite to Pre-Calculus. This may afford the advantage for the scholar to exempt coursework advance the scholar into higher level courses. Successful completion of higher level math classes will elevate potential and interest for the scholar at four-year universities such as Georgia Tech, University of Georgia, Georgia State, and others.

AT DECA: we will devote several weeks during the course of the semester in preparation for the Compass Test which the students will take sometime in April or May. Scholars may be required to complete practice problems at MYFOUNDATIONSLAB.com. These required assignments will be computed into the class average for the scholars at 20% (See Grading Scale Above).

It is mandatory that scholars complete these assignments in order to maximize their potential scores on the Compass Test.

Scholars will take the compass test in the spring to determine placement in math and English courses at GPC. The compass test is given each day of the week (except holidays) by appointment at the location of choice. Scholars should be in contact with the respective schools in order to schedule an appointment. Friday's will be COMPASS TEST review days in order to adequately prepare students for taking this test.

STUDENT/PARENT INFORMATION

To be returned by Friday, August 15, 2014

I will use this form to remain in contact with you concerning your child's progress at DECA. Please fill out every line that applies including day and evening e-mails and phone numbers.

I have read the Math 1 syllabus. I will instruct and expect my child to uphold the rules and guidelines outlined in Professor Stone's math class. I understand that any violation of classroom expectations may result in suitable disciplinary action.

Student Signature: _____ Date:

_____

Parent/Guardian Signature: _____ Date:

_____

Student Name (Please Print Legibly) _____

Home phone _____

Home e-mail address

_____

Mother/Guardian Name (Please Print Legibly)

_____

Home phone _____

Daytime phone _____

Cell phone _____

Home e-mail address

_____

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Father/Guardian Name (Please Print Legibly)

_____

Home phone _____

Daytime phone _____

Cell phone _____

Home e-mail address

_____