COURSE OUTLINE

MATH 121 – COLLEGE ALGEBRA

Prepared By:  Jesse Clark-Stone and Jon Thompson
A. **TITLE:** COLLEGE ALGEBRA  
B. **COURSE NUMBER:** MATH 121  
C. **CREDIT HOURS:** 4  
D. **WRITING INTENSIVE COURSE:** N/A  
E. **COURSE LENGTH:** 15 Weeks  
F. **SEMESTER(S) OFFERED:** Spring and Fall semesters  
G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:** Four hours per week  
H. **CATALOG DESCRIPTION:** This course provides basic algebraic concepts and an introduction to trigonometric and logarithmic functions. Emphasis is placed on equations and inequalities; polynomials, rational, exponential and logarithmic functions; and graphing and data analysis including modeling and linear regression. Additional topics include complex numbers; radical functions; right triangle trigonometry; systems of equations; and elementary transcendental functions.  
I. **PRE-REQUISITES:** Intermediate Algebra (MATH 106) with a grade of C or better, or 2 high school regents math courses with a grade of 75 or above on the second New York State Regents mathematics examinations, or permission of instructor. Cannot be taken for credit by students with credit in Precalculus Algebra and Trigonometry (MATH 123).  
J. **GOALS (STUDENT LEARNING OUTCOMES):** By the end of the course students will be able to:  

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<th>Course Objective</th>
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| a. Solve linear, polynomial, and rational equations/inequalities as well as absolute value, radical, exponential, and logarithmic equations | 1. Communication  
|                                                                                   | 2. Critical Thinking              |
| b. Graph functions and find zeros, domains, ranges, inverses. Perform simpler operations and composition of functions | 1. Communication  
|                                                                                   | 2. Critical Thinking              |
| c. Find trigonometric function values and convert between angle measures           | 1. Communication  
|                                                                                   | 2. Critical Thinking              |
| d. Solve right and oblique triangles                                              | 1. Communication  
|                                                                                   | 2. Critical Thinking              |
| e. Solve systems of linear and non-linear equations using the methods of graphing, substitution, and addition/elimination | 1. Communication  
|                                                                                   | 2. Critical Thinking              |

L. **REFERENCES:** Many materials in the Math Lab and online will aid the students with mastery of this subject  
M. **EQUIPMENT:** The type of technology and its mode of implementation is left to the discretion of the instructor.  
N. **GRADING METHOD:** A-F  
O. **MEASUREMENT CRITERIA/METHODS:**  
   - Homework
• quizzes
• exams
• projects

P. **DETAILED COURSE OUTLINE:**

I. Graphs Functions and Models
   1. Functions and graphs
   2. Slope of a line segment and equations of lines
   3. Linear Regression
   4. Piecewise defined functions
   5. The algebra of functions
   6. Symmetry and transformations of functions

II. Functions, Equations, and Inequalities
   1. Linear equations
   2. Complex numbers
   3. Quadratic functions and equations
   4. Analyzing graphs of quadratic functions
   5. Rational equations and equations involving absolute value
   6. Linear inequalities
   7. Linear systems in two variables
   8. Nonlinear systems in two variables

III. Polynomial Functions and their Graphs
   1. Introduction to polynomial functions
   2. Graphs of polynomials
   3. Polynomial division
   4. Fundamental Theorem of Algebra and Rational Root Theorem
   5. Polynomial Inequalities
   6. Rational Inequalities

IV. Exponential and Logarithmic Functions
   1. Inverse functions
   2. Introduction to exponential functions and the number \( e \)
   3. Logarithmic functions
   5. Exponential and logarithmic equations
   6. Transcendental Applications

V. Introduction to Trigonometry
   1. Angle measure
   2. Evaluation of trigonometric functions (of any angle)
   3. Solve right triangles
   4. Solve oblique triangles
   5. Applications of trigonometry

Q. **LABORATORY OUTLINE:** N/A