**Department Master Syllabus**

**Camden County College**

**Blackwood, New Jersey**

**Course Title**: Algebraic Concepts

**Course Number**: MTH-100

### **Department/Program Affiliation**: Mathematics

**Date of Review: New 12/2010**

(This Department Master Syllabus has been examined by the program/department faculty members and it is decided that no revision is necessary at this time.)

**Date of Last Revision**:

(This Department Master Syllabus has been examined by the program/department faculty members and it is decided a change requiring a revision is necessary at this time.)

**N.B.** A change to the course materials alone (textbooks and/or supplementary materials) may not constitute a revision. Any other change to the items listed below on this form is considered a revision and requires approval by the program faculty at a Program/Department Meeting and by the division at a Chairs and Coordinator Meeting.

**Credit Hours**: **4**

**Contact Hours: Lecture 4 Lab 0 Other**

**Prerequisite**: MTH-029 OR MTH-035 (Elementary Algebra) and ENG-013 (Reading

Skills III) or proper placement exam scores

**Corequisites:** None

**Course Description:**

This course covers the study of algebraic concepts with emphasis on algebraic manipulations and problem solving. Topics include factoring & special factorizations; rational expressions; rational exponents; solving rational, radical, and quadratic equations; solving systems of equations; graphing linear functions; linear inequalities; functions and relations; complex numbers; function composition and inverse functions; graphs of exponential and logarithmic functions; and solving exponential and logarithmic equations. Students are required to have a scientific, **non-graphing** calculator.

**Course Student Learning Outcomes:** (Cognitive, Psychomotor, Affective Domains)

Upon completion of this course, the student will be able to:

* demonstrate proficiency in solving linear equations, linear inequalities, and absolute value equations and represent the solutions using interval notation as well as graphically.
* demonstrate proficiency in representing linear equations in various forms (point-slope form, slope intercept form, general form).
* demonstrate understanding of the concept of function by several means (verbally, numerically, graphically, and symbolically) and identify the domain and range of a function.
* evaluate functions and complex numbers using the sum, difference, product, and quotient rules.
* perform basic operations on rational exponents and radicals and simplify.
* solve quadratic equations by factoring, square root property, completing the square and quadratic formula.
* construct graphs by plotting points of linear and quadratic functions.
* translate real-world problems using mathematical equations or inequalities and use the solution to solve the problem.
* solve systems of linear equations, rational equations and inequalities and be able to use these tools in the solution of practical applications.
* graph and solve exponential and logarithmic equations.

**General Education Student Learning Outcomes:**

# Students will apply appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

# Course Outline:

**Unit I**

Graphing Lines in the coordinate plane

Slope of a Line

Three Forms for the Equation of a Line

Inequalities and Compound Inequalities

Absolute Value Equations and Inequalities

Linear Inequalities and their graphs

Functions and Relations

**Unit II**

Solving 2 x 2 Linear Systems by Graphing, Substitution, and the Addition Method

Solving Systems of Linear Equations in Three Variables

**Unit III**

Laws of Exponents

Polynomials and polynomial Functions

Factoring Polynomials by Grouping

Special Factorizations: Difference of 2 Squares; and the Sum and Difference of 2 Cubes

**Unit IV**

Operations on Rational Expressions and Complex Fractions

**Unit V**

Radicals and Rational Exponents

Adding, Subtracting, and Multiplying Radicals

Quotients, Power, and Rationalizing Denominators

Solving Equations with radicals and Exponents

Complex Numbers

**Unit VI**

Completing the Square

The Quadratic Formula

More on Quadratic Equations

Quadratic Functions and Their Graphs

Quadratic and Rational Inequalities (If time permits)

**Unit VII**

Combining Functions

Inverse Functions

**Unit VIII**

Exponential Functions and Their Applications

Logarithmic Functions and Their Applications

Properties of Logarithms

Solving Exponential and Logarithmic Equations and Applications

**Instructional Materials:**

Instructors may employ a variety of lecture tools including black/white board scribing, power point presentations, document reader projections, software, etc…

**Course Activities:**

The classroom activities will include formal and informal lectures where new material and assigned problems will be explained; the use of computer software, if applicable; collaborative learning in small groups and weekly independent work out of class. Students will have the opportunity to contribute to the discussion and to ask questions about the material. **Students will use scientific calculators only for the material on exponential and logarithmic functions. No graphing calculators are permitted.**

**Assessment of Student Learning Outcomes**: The student will be evaluated on the degree to which student learning outcomes are achieved. A variety of methods may be used such as tests, class participation, projects, homework assignments, etc. (there must be some evidence that the learning outcomes have been achieved.)

1. Four or five in-class tests

2. Periodic quizzes, if you deem they are necessary to motivate students to study and to attend class on a regular basis.

3. Electronic Homework assignments, if graded. (optional)

4. Other graded homework or projects.

5. Class attendance, if you have specified this at the beginning of the semester.

6. Departmental, comprehensive final examination

## Grading:

Grades will be based on the student’s performance in the above designated areas. Percentages will be assigned by each individual professor.

A 90 to 100

B 80 to 89

C 70 to 79

D 60 to 69

F Below 60

I Incomplete (only under extreme emergencies)

NA Not Attending

XA Never Attended

W Withdraw (student must submit an official withdrawal form by the deadline)

**Course Materials:**

**Textbook:** *Algebra for College Students By Dugopolski 5th*  Ed..

Mc Graw Hill

**Students are required to have a scientific, non-graphing calculator**.

**Supplemental materials**: Textbook specific course management system.