MATH 86 - Support for College Algebra Course Outline

Approval Date: 12/13/2018
Effective Date: 08/12/2019

SECTION A

Unique ID Number	CCC000601129
Discipline(s)	Mathematics
Division	Mathematics
Subject Area	Mathematics
Subject Code	MATH
Course Number	86
Course Title	Support for College Algebra
TOP Code/SAM Code	1702.00 - Mathematics Skills / E - Non-Occupational
Rationale for adding this course to the curriculum	This course will help students who are almost ready to succeed in College Algebra, but for whom the just in time remediation will provide foundation for that success. This course complies with AB705 and chancellor's office directives.
Units	2.5
Cross List	*N/A*
Typical Course Weeks	18

Total Instructional Hours

	Contact Hours
Lecture	36.00
Lab	0.00
Activity	18.00
Work Experience	0.00
Outside of Class Hours	81.00

Total Contact Hours	54
Total Student Hours	135

Open Entry/Open Exit	No
Maximum Enrollment	35
Grading Option	P/NP Only

Distance Education Mode of Instruction On-Campus

SECTION B

General Education Information:

SECTION C

Course Description

Repeatability May be repeated 0 times

Catalog Description Math 86, Support for College Algebra, is open only to students concurrently enrolled in Math 106, College Algebra. Concepts will be covered using a just-in-time approach for understanding of the corresponding concepts as they are presented in Math 106. This course is designed to offer support for students who lack the strong algebra background to succeed in Math 106.

Schedule Description Math 86, Support for College Algebra, is open only to students concurrently enrolled in Math 106, College Algebra. Concepts will be covered using a just-in-time approach for understanding of the corresponding concepts as they are presented in Math 106. This course is designed to offer support for students who lack the strong algebra background to succeed in Math 106.

SECTION D

Condition on Enrollment

1a. Prerequisite(s)

- Appropriate Placement or
- MATH 85 with a minimum grade of C or better

1b. Corequisite(s)

- MATH 106

1c. Recommended

- Math 86 is open entry, and will provide students with the algebra needed to succeed in Math 106, College Algebra. Students who would like more time to build their algebra foundation than this concurrent course will provide, should consider taking Math 95. In addition, Math 86, requires that students have a fundamental understanding of topics from beginning Algebra such as operations on fractions and solving equations. Students without this understanding should consider taking Math 85.

1d. Limitation on Enrollment: *None*

SECTION E

Course Outline Information

1. Student Learning Outcomes:

A. Graph functions.
B. Solve equations.
C. Simplify expressions.

2. Course Objectives: Upon completion of this course, the student will be able to:

A. Solve polynomial, rational, absolute value, radical, exponential and logarithmic equations;
B. Solve systems of linear equations;
C. Graph linear and nonlinear functions, parabolas and circles;
D. Solve linear and absolute value inequalities;
E. Perform basic operations on functions;
F. Find inverse functions;

G. Use mathematical modeling to solve problems relating to exponential growth, and decay, mixing, and optimization;
H. Use function notation and evaluate domain and range for all functions types studied and;
I. Study for a math class effectively.
J.

3. Course Content

Using a just-in-time approach, the following content will be covered as required for success in the corequisite College Algebra course.

A. Linear and absolute value equations and inequalities
    a. Linear functions (finding and graphing)
    b. Graphing linear inequalities
    c. Solving absolute value equations
    d. Absolute value inequalities
B. Graphing linear equations
    a. Equations in two variables
    b. Slope and graphing
    c. Using slope-intercept and point-slope formulas
    d. Horizontal and vertical lines
    e. Parallel and perpendicular lines
C. Systems of equations
    a. Solving systems of two equations with two unknowns (graphing, substitution, elimination)
    b. Applications of systems
    c. Solving systems of linear inequalities by graphing
    d. Solving systems of three equations with three unknowns
D. Exponents and polynomials
    a. Review of order of operations
    b. Review exponent rules
    c. Negative exponents
    d. Scientific notation (including arithmetic operations)
    e. Addition and subtraction of polynomials with several variables
    f. Multiplying polynomials (including special products and several variables)
    g. Dividing polynomials (including long division)
    h. Factoring polynomials (grouping, binomials, trinomials)
    i. Solving polynomial equations by factoring
E. Rational expressions and equations
    a. Rational expressions and functions (including domain)
    b. Multiplication and division
    c. Adding and subtracting with common and uncommon denominators
    d. Complex fractions
    e. Proportions and dimensional analysis
    f. Solving rational equations
F. Radical expressions and equations
    a. Roots and radical notation with rational exponents
    b. Simplifying radicals and radical expressions
    c. Adding and subtracting
    d. Multiplying and dividing
    e. Solving radical equations

f. Radical functions (simple graphs and domain restrictions)
g. Complex numbers (brief, but include conjugates)

G. Quadratics
   a. Solving by factoring, square root property, completing the square and quadratic formula
   b. Quadratic functions and graphs
   c. Finding maximums and/or minimums

H. Functions
   a. Function notation
   b. Analyzing the graphs of functions
   c. Composition of functions
   d. Evaluating piecewise defined functions from equation and graph
   e. Domain and range

I. Logarithms and exponentials
   a. Inverse functions (including domain and range)
   b. Exponential functions and their graphs (including domain and range)
   c. Logarithmic functions and their graphs (including domain and range)
   d. Properties of logarithms
   e. Solving logarithmic and exponential equations
   f. Applications including growth, decay and interest

J. Equations of circles and their graphs (centered at origin)

K. Study skills / affective domain (this should be integrated into the class, not taught as a separate section)
   a. Growth mindset and grit
   b. How to study for a math class
   c. Test taking strategies
   d. Campus resources
   e.

4. Methods of Instruction:

Activity:
Discussion:
Lecture:
Projects:

5. Methods of Evaluation: Describe the general types of evaluations for this course and provide at least two, specific examples.

Typical classroom assessment techniques

Exams/Tests --
Quizzes --
Home Work --
Final Exam --
Mid Term --

Additional assessment information:

In face to face classes, it is recommended that one hour a week in the Math Success Center be assigned as a homework assignment worth 3 - 5% of the semester grade.

The Mathematics Department maintains a commitment to diverse teaching methods in courses emphasizing vital quantitative skills and qualitative reasoning ability (PEP Program Mission Statement, 2011). To that end, it is expected that sufficient formative assessments will be given to students that in frequency, length and rigor adequately assess both quantitative skills and qualitative reasoning.

Example 1: Find all the zeros, maximum or minimum value, and at least two other points of a given quadratic function, then graph.

Example 2: Solve a given system of three equations with three unknowns.

P/NP Only

6. Assignments: State the general types of assignments for this course under the following categories and provide at least two specific examples for each section.

A. Reading Assignments
Read the section on maximum/minimum function values before our next class period and be prepared to do an in class activity.

B. Writing Assignments
Example 1) Online or Paper Homework: Complete assigned exercises from the applicable section in the text.

Example 2) Group Activity: Given a quadratic equation, find all the zeros, the maximum or minimum value, and at least two other points, then graph.

C. Other Assignments

D.

7. Required Materials

A. EXAMPLES of typical college-level textbooks (for degree-applicable courses) or other print materials.

Book #1:

Author:	Woodbury, G.
Title:	Intermediate Algebra a STEM Approach
Publisher:	Pearson
Date of Publication:	2019
Edition:	1st

B. Other required materials/supplies.