# MATH 106 - College Algebra Course Outline

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

**SECTION A**

| | |
|---|---|
| **Unique ID Number** | CCC000601128 |
| **Discipline(s)** | Mathematics |
| **Division** | Mathematics |
| **Subject Area** | Mathematics |
| **Subject Code** | MATH |
| **Course Number** | 106 |
| **Course Title** | College Algebra |
| **TOP Code/SAM Code** | 1701.00 - Mathematics, General / E - Non-Occupational |
| **Rationale for adding this course to the curriculum** | We are adjusting the units to better reflect the needs of this class, and making adjustments to our SLOs as per our department cycle. |
| **Units** | 4 |
| **Cross List** | *N/A* |
| **Typical Course Weeks** | 18 |

**Total Instructional Hours**

| | **Contact Hours** |
|---|---|
| **Lecture** | 54.00 |
| **Lab** | 0.00 |
| **Activity** | 36.00 |
| **Work Experience** | 0.00 |
| **Outside of Class Hours** | 126.00 |

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| | |
|---|---|
| **Total Contact Hours** | 90 |
| **Total Student Hours** | 216 |
| **Open Entry/Open Exit** | No |
| **Maximum Enrollment** | 35 |
| **Grading Option** | Letter Grade Only |
| **Distance Education Mode of Instruction** | On-Campus<br>Hybrid |

## SECTION B

**General Education Information:**

## SECTION C

**Course Description**

**Repeatability** May be repeated 0 times

**Catalog Description** This course provides a strong algebraic foundation for the study of Calculus. From numerical, graphing, and analytical views, the course studies functions, including: polynomial, rational, exponential and logarithmic. Series, sequences and conic sections are also included. A graphing calculator is required.

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## SECTION D

**Condition on Enrollment**

**1a. Prerequisite(s)**

- MATH 95 with a minimum grade of C or better or
- Appropriate Placement

**1b. Corequisite(s):** *None*

**1c. Recommended:** *None*

**1d. Limitation on Enrollment:** *None*

## SECTION E

**Course Outline Information**

**1. Student Learning Outcomes:**

A. Graph polynomial, rational, radical, exponential, logarithmic and conic equations by hand.
B. Solve polynomial, exponential, logarithmic, systems of equations and inequalities.

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

A. Analyze and investigate properties of functions;
B. Synthesize results from the graphs and/or equations of functions;
C. Graph the elementary functions, examine their basic properties, and apply transformations to the graphs of functions;
D. Recognize the relationship between functions and their inverses graphically and algebraically;
E. Solve and apply rational, linear, polynomial, radical, absolute value, exponential and logarithmic equations, by hand and with technology;
F. Solve linear, nonlinear, and absolute value inequalities;
G. Solve systems of equations and inequalities;
H. Apply the Remainder Theorem, Factor Theorem, and the Fundamental Theorem of Algebra;
I. Apply functions and other algebraic techniques to model real world Science, Engineering and/or Mathematical applications;
J. Analyze conic sections algebraically and graphically;
K. Use formulas to find sums of finite and infinite series; and
L. Use limit notation to discuss end behavior of polynomial and rational functions.
M.

**3. Course Content**

A. Functions including linear, polynomial, rational, radical, exponential, absolute value, logarthimic: definitions, evaluation, domain and range;
B. Inverses of functions;
C. Algebra of functions;
D. Graphs of functions including asymptotic behavior, intercepts and vertiecies;
E. Transformations of quadratic, absolute value, radical, rational, logarithmic and exponential functions;
F. Equations including rational, linear, polynomial, radical exponential, absolute value and logartihmic;
G. Linear, nonlinear and absolute value inequalities;
H. Systems of equations (with matricies) and inequalities;
I. Partial fraction decomposition;
J. Characterization of the zeros of polynomials;
K. Properties and applications of Complex numbers;
L. Properties of conic sections;
M. Sequences and series including arithmetic, geometric, recursive, subscript notation and sigma notation;
N. Introduction to limit notation and continuity via polynomial and rational functions.
O.

**4. Methods of Instruction:**

**Activity:**
**Discussion:**
**Lecture:**
**Observation and Demonstration:**
**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 --
Oral Presentation --
Projects --
Home Work --
Final Exam --
Mid Term --

Additional assessment information:

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.

Sample assessment questions follow:
1 - For the function f(x) = 2x^3 - 3x^2 - 11x + 6; Use the Rational Zero Theorem to find all the zeros.

2 - Find the vertical asymptotes, if any, and the values of x corresponding to holes, if any, of the rational function f(x)= (x + 7)/(x^2 + 4x - 21)

Letter Grade 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 sections from the textbook, for example:
   1. Read section 2.5 on Transformations of Functions. Be ready to discuss and work on graphing activities in class.
   2. Read section 7.1 on The Ellipse. Be ready to discuss and work on graphing activities in class.

B. Writing Assignments
   Students will solve text problems regarding College Algebra, for example:
   1. Complete exercises 1 - 15 odd from section 3.3 on dividing polynomials.
   2. Find all requested information and graph the indicated rational functions in exercises 21 - 56 odd from section 3.5 on rational functions and their graphs.

C. Other Assignments

D.

**7. Required Materials**

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

Book #1:

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|---|---|
| Author: | Robert Blitzer |
| Title: | College Algebra |
| Publisher: | Pearson |
| Date of Publication: | 2018 |
| Edition: | 7th |

**B. Other required materials/supplies.**

- Graphing Calculator