

## MATH 116 PreCalculus Algebra I

### 1. Catalog Description

#### **MATH 116 Precalculus Algebra I**

**3 units**

GE Area B1

Prerequisite: Passing score on ELM examination, or an ELM exemption, or credit in MATH 96 (formerly MATH 104).

Pre-calculus college algebra without trigonometry. Special products and factoring, exponents and radicals. Fractional and polynomial equations. Matrices, determinants, and systems of equations. Polynomial, rational, exponential, and logarithmic functions. Graphing, inequalities, absolute value, and complex numbers. MATH 116 and MATH 117 are equivalent to MATH 118, but are taught at a slower pace. Upon completion of MATH 116 and MATH 117, a student will receive 4 units of GE credit for Area B1. Students admitted Fall 2016 or later need a grade of C- or better in one of their GE B1 requirements in order to fulfill GE Area B. Not open to students with credit in MATH 118, MATH 141, MATH 161, or MATH 221. Credit will be granted in only one of the following courses: MATH 116, MATH 118. 3 lectures.

### 2. Required Background or Experience

The ability to perform all of the routine algebraic operations with accuracy and confidence.

### 3. Learning Objectives

The student should be able to:

- a. Use and understand the language and notation of the algebra of functions.
- b. Use and understand the basic properties of polynomial functions.
- c. Use and understand the basic algebraic principles of graphing.
- d. Solve linear and quadratic equations and inequalities.
- e. Perform arithmetic operations with complex numbers.

### 4. Text and References

- Dugopolski, Mark, Precalculus: Functions and Graphs, Custom Edition for Cal Poly, Pearson/Addison-Wesley.

### 5. Minimum Student Materials

Paper, pencils and notebook.

### 6. Minimum University Facilities

Classroom with ample chalkboard space for demonstration and class use.

## 7. Content and Method

| <u>Topic</u>                                             | <u>Lectures</u> |
|----------------------------------------------------------|-----------------|
| <b>Chapter 1: Equations, Inequalities, and Modeling</b>  | 10              |
| 1.1 Equations in One Variable                            |                 |
| 1.2 Constructing Models to Solve Problems                |                 |
| 1.3 Equations and Graphs in Two Variables                |                 |
| 1.4 Linear Equations in Two Variables                    |                 |
| 1.6 Complex Numbers                                      |                 |
| 1.7 Quadratic Equations                                  |                 |
| 1.8 Linear and Absolute Value Inequalities               |                 |
| <b>Chapter 3: Functions and Graphs</b>                   | 8               |
| 3.1 Functions                                            |                 |
| 3.2 Graphs of Relations and Functions                    |                 |
| 3.3 Families of Functions, Transformations, and Symmetry |                 |
| 3.4 Operations with Functions                            |                 |
| 3.5 Inverse Functions                                    |                 |
| 3.6 Constructing Functions with Variation                |                 |
| <b>Chapter 5: Polynomial and Rational Functions</b>      | 6               |
| 5.1 Quadratic Functions and Inequalities                 |                 |
| 5.2 Zeros of Polynomial Functions                        |                 |
| 5.3 The Theory of Equations                              |                 |
|                                                          | Total 24        |

## 8. Methods of Assessment

The primary methods of assessment are: essay examinations, quizzes and homework. Typically, there will be one or more hour-long examinations during the quarter, and a required comprehensive final examination. Students are required to show their work, and are graded not only on the correctness of their answers, but also on their understanding of the concepts and techniques.