

MATH 117 Pre-Calculus Algebra II

1. Catalog Description

MATH 116, 117 Pre-Calculus Algebra I, II (3) (3) For MATH 116 and 117: GE B1

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. Not open to students with credit in MATH 118. 3 lectures. **MATH 116** prerequisite: Passing score on ELM examination, or an ELM exemption, or credit in MATH 104. **MATH 117** prerequisite: MATH 116 with a grade of C- or better or consent of instructor.

2. Required Background or Experience

The ability to perform all of the routine algebraic operations with accuracy and confidence, and Math 116 with a grade of C- or better.

3. Learning Objectives

The student should be able to:

- a. Use and understand the basic properties of polynomial and rational functions.
- b. Use and understand the basic properties of exponential and logarithmic functions.
- c. Use and understand the basic algebraic principles of graphing.
- d. Perform the basic operations with matrices and determinants.
- e. Solve systems ($n < 4$) of linear equations using matrices and determinants.

4. Text and References

Dugopolski, Mark, Precalculus: Functions and Graphs, 2nd ed., Pearson/Addison-Wesley, 2005.

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>
Chapter 3: Polynomial and Rational Functions	8
3.4 The Theory of Equations (<i>review</i>)	
3.5 Miscellaneous Equations	
3.6 Graphs of Polynomial Functions	
3.7 Rational Functions and Inequalities	
Chapter 4: Exponential and Logarithmic Functions	8
4.1 Exponential Functions and Their Applications	
4.2 Logarithmic Functions and Their Applications	
4.3 Rules of Logarithms	
4.4 More Equations and Applications	
Chapter 8: Systems of Equations and Inequalities	4
8.1 Systems of Linear Equations in Two Variables	
8.2 Systems of Linear Equations in Three Variables	
8.3 Nonlinear Systems of Equations (<i>optional</i>)	
8.4 Partial Fractions (<i>optional</i>)	
8.5 Inequalities and Systems of Inequalities in Two Variables	
Chapter 9: Matrices and Determinants	4
9.1 Solving Linear Systems Using Matrices	
9.2 Operations with Matrices	
9.3 Multiplication of Matrices	
9.4 Inverses of Matrices (<i>optional</i>)	
9.5 Solution of Linear Systems in Two Variables Using Determinants	
9.6 Solution of Linear Systems in Three Variables Using Determinants	
Total	24

8. Methods of Assessment

The primary methods of assessment are, in decreasing order of importance: essay examinations, quizzes and homework. Typically, there will be two or three hour-long examinations during the quarter, and a 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. Quizzes are usually given once or twice a week to provide a spot check of student learning. Homework is required daily. Since this class satisfies a General Education requirement, at least 10% of the grade must be based on writing using correct mathematical notation.

9. Additional Comments

- a. The text has many interesting applications. Also note the review sections at the end of each chapter.
- b. The text is readable; students should be advised to read each section *before* coming to class.
- c. The text is bundled with several supplements: The Student's Solutions Manual, Math XL[®], and the Digital Video Tutor. See the preface of the text for additional information.
- d. Additional instructor supplements (test banks, etc.) are available from the course supervisor.