

COURSE OUTLINE**Mathematics 220A  
Intermediate Algebra II****I. Catalog Statement**

Mathematics 220A is the first part of a self-paced multimedia course. Mathematics 220AB collectively is equivalent to the second course of a two-semester sequence of Intermediate Algebra. Topics include quadratic equations and inequalities, arithmetic and geometric sequences and series, the binomial theorem, conic sections, inverse functions, graphs of functions, systems of nonlinear equations and inequalities, and exponential and logarithmic functions. Mathematics 220AB collectively is equivalent to Mathematics 120.

Total Lecture Units: 1.0

**Total Course Units: 1.0**

Total Laboratory Hours: 48.0 (3 hours per week)

**Total Faculty Contact Hours: 48.0 (3 hours per week)**

Total Class Hours To Be Arranged: 48.0 (3 hours per week)

Prerequisite: Satisfactory completion of Mathematics 119, or Mathematics 219C or 3 units of Mathematics 219.

Note: This course may not be taken for credit by students who have completed Mathematics 101 or 120. A maximum of 5 units of credit will be granted for Mathematics 101, 119, 120, 219, and 220. A maximum of 7 units will be granted for Mathematics 220 and 131.

**II. Course Entry Expectations**

Skills Level Ranges: Reading 5; Writing 4; Listening-Speaking 5; Math 4

Prior to enrolling in the course, the student should be able to:

1. solve absolute value equations and inequalities;
2. solve linear equations and compound inequalities;
3. graph lines;
4. perform operations with polynomials;
5. simplify complex fractions;
6. perform operations with radical expressions;
7. simplify expressions with rational exponents;
8. divide synthetically;
9. solve rational equations;
10. solve equations with radicals;
11. find the equation of a line parallel or perpendicular to a given line;
12. solve a system of linear equations using elimination, substitution, and Cramer's rule;

13. solve systems of linear inequalities;
14. find the composition of two functions;
15. solve applied problems.

### **III. Course Exit Standards**

Upon successful completion of the required course work, the student will be able to:

1. solve absolute value equations and inequalities;
2. solve linear equations and compound inequalities;
3. perform operations with polynomials;
4. simplify complex fractions;
5. perform operations with radical expressions;
6. simplify expressions with rational exponents;
7. divide polynomials synthetically;
8. solve rational equations;
9. solve radical equations;
10. find the equation of a line;
11. solve a system of linear equations;
12. solve systems of linear inequalities;
13. find the composition of two functions;
14. solve application problems;
15. solve quadratic equations with real and complex solutions;
16. find the inverse of a function;
17. use the properties of logarithms to simplify and expand expressions;
18. solve logarithmic and exponential equations;
19. find the  $n$ th term of arithmetic and geometric sequences;
20. find the sum of a finite series and an infinite geometric series;
21. graph functions (linear, quadratic, exponential, logarithmic);
22. graph conic sections centered at any point;
23. solve a non-linear system;
24. expand the power of a binomial.

### **IV. Course Content**

**Total Contact Hours = 96**

- A. Review of Intermediate Algebra I
  1. Equations and inequalities in one variable
  2. Lines and functions
  3. Systems of linear equations and inequalities
  4. Exponents and polynomials
  5. Rational expressions and functions
  6. Radicals and rational exponents
- B. Quadratic Equations
  1. Completing the square
  2. Quadratic formula
  3. The discriminant and its applications
  4. Equations quadratic in form
  5. Non-linear inequalities of one variable
  6. Parabolas

C. Exponential and Logarithmic Functions

1. One-to-one functions
2. Inverse functions
3. Exponential functions
4. Logarithmic functions
5. Properties of logarithms
6. Common and natural logarithms
7. Exponential equations and change of base
8. Solving logarithmic equations
9. Applications

V. **Methods of Instruction**

The following instructional methodologies may be used in the course:

1. weekly meetings with instructor;
2. video instruction;
3. computer tutorials;
4. personalized tutoring;
5. collaborative learning.

VI. **Out of Class Assignments**

The following out of class assignments may be used in the course:

1. homework;
2. online assignments.

VII. **Methods of Evaluation**

The following methods of evaluation may be used in the course:

1. a cumulative final exam at the end of each course/unit;
2. two to three chapter tests will be given per course/unit;
3. short mastery quizzes may be given online.

VIII. **Textbook**

McKeague, C. P., *Intermediate Algebra*. Custom Edition for GCC, 9<sup>th</sup> Edition.

Mason: Cengage Learning, 2011.

11<sup>th</sup> Grade Textbook Reading Level. ISBN: 1-111-75205-2.

IX. **Student Learning Outcomes**

Upon successful completion of the required coursework, the student will be able to:

1. solve equations and inequalities (quadratic, exponential, logarithmic, systems).
2. use the properties of logarithms to simplify exponential and logarithmic expressions.
3. graph various functions and relations (linear, quadratic, exponential, logarithmic, conic sections).
4. use mathematical models to solve application problems (exponential, logarithmic, sequences, series).
5. apply the formulas of sequences and series (arithmetic, geometric, binomial).