

Algebra I Content Refresher for Teachers (MTE 506)

3 semester hours graduate credit

Offered by Converse College

in partnership with

South Carolina Educational Communications

COURSE SYLLABUS

CATALOG DESCRIPTION:

Designed for mathematics teachers, this course is a presentation of the Algebra I content presented at the secondary school level.

It will refresh the teacher's knowledge of Algebra I and demonstrate the use of appropriate technologies. A background in Pre-Algebra is recommended.

GOALS:

1. To refresh the participating teachers' content knowledge in Algebra I.
2. To initiate or revitalize participating teachers' interest in Algebra I

TEXT, MATERIALS AND SOFTWARE:

Four video tapes that contain 21 hours of instruction are provided. The video content provides the text materials for this course. A recommended textbook is listed below only to provide background information and it is not required for the completion of this course. Participants may also use another Algebra I text in its place.

Algebra I: An Integrated Approach, McDougal, Littel/Houghton

In addition, four Practice Problem Sets are provided to each student and they are located on the course web site.

GRAPHING CALCULATOR

The use of a graphing calculator is required. While participants may use any graphing

calculator, the instruction on the video tapes uses the TI-83. Knowledge and competence for use of other graphing calculators will be the sole responsibility of the participant.

COURSE REQUIREMENTS:

This course will be offered through Distance Education. Participating teachers will receive four videotapes to view at their convenience, taking up to nine months to complete all requirements. There are no scheduled class sessions or meetings. There is an Internet web site that contains practice problems, four quizzes - one for each videotape - and a cumulative Final Examination.

1. The participant must view the four Video Tapes and supply a written statement that this has been accomplished. (Evaluation - Statement must be included with the End of Course packet - without it no credit is to be awarded.)
2. Participants must complete the four Practice Problem sets that are provided on the course web site. (Evaluation - The Practice Sets showing student work are submitted in the End of Course packet - without them, no credit will be awarded.)
3. Each of the four Video Tapes will have an accompanying quiz posted on this web site. The participant must complete each of these quizzes online and also submit printed copies of each quiz that shows their work in the end of course packet. (Evaluation - Each of the four quizzes will count 14% of the final grade.)
4. There will be a cumulative final examination. The participants will complete the final exam in the presence of a school or district administrator, have the administrator validate it, and then the participant submits it in the End of Course packet. The participants will also enter their answers to the exam online. (Evaluation – The final examination will count 46% of the final grade.)

GRADING:

Each question, whether a quiz question or a final exam question, will count as one point. There will be four quizzes consisting of six questions and one cumulative final exam consisting of twenty questions. Based on these forty-four questions, the grading scale is listed below. No other grade is given to this course. If you do not complete the course a grade of F is awarded.

A = 44-42 correct
A- = 41-40 correct
B+ = 39-38 correct
B = 37-36 correct
B- = 35-34 correct

C+ = 33-32 correct
C = 31-30 correct
C- = 29-26 correct
F = 25 or less correct

COURSE TOPICS

VIDEO #1 - Pre-Algebra and 1 Variable Equations and Inequalities

1. Introduction
2. Overview of Curriculum and Topics
3. Pre-Algebra
 - Rules and Order of Operations
 - Formulas and Evaluating Expressions
 - Integers and Fractions
 - Exponents and Square Roots
4. Introduction to Algebra
 - Definition
 - Connections
 - Variables and Variable Expressions
 - Equations and Inequalities
 - Translating from English to Algebra
5. 1 Variable Equations
 - 1 and Multi-step Equations
 - Literal and Absolute Value Equation
6. Equations With Fractions
 - Ratios and Proportions
 - Variation
7. 1 Variable Inequalities
 - 1 and Multi-step Inequalities
 - Compound Inequalities
 - Absolute Value Inequalities

VIDEO #2 - Linear Equations and Inequalities

1. Introduction to Functions
2. Graphing Linear Equations
 - Points and Solutions
 - Graphing
 - Intercepts
 - Absolute Value Equations
3. Slope
 - Definition and Calculating
 - Slope-intercept Form
 - Graphing With Calculator
4. Writing Equations
 - Write Equation Given About the Line
 - Standard Form
 - Point-Slope Form
5. Systems
 - Solve by Graphing
 - Solve by Substitution or Linear Combination

- Solve with Matrices
- Special Solutions
- 6. Linear Programming
- Graph Systems of Inequalities
- Maximize Functions
- Word Problems

VIDEO #3 - Non-Linear Equations and Inequalities - Part 1

1. Powers and Exponents
 - Properties
 - Scientific Notation
 - Exponential Functions
2. Quadratics
 - Solve with Square Root
 - Quadratic Formula
 - Quadratic Inequalities
3. Polynomials
 - Adding and Subtracting
 - Multiplying by a Monomial
 - Multiplying by a Polynomial

VIDEO #4 - Non-Linear Equations and Inequalities - Part 2

1. Factoring
 - Special Factors
 - GCF
 - Factoring Trinomials
 - Solving Quadratics with Factoring
2. Rational Functions
 - Simplifying
 - Adding and Subtracting
 - Multiplying and Dividing
 - Dividing Polynomials
 - Solving Rational Equations
3. Radical Equations (Connections to Geometry)
 - Pythagorean Theorem
 - Distance Formula
 - Radical Operations
 - Solve Radical Equations