

COURSE OUTLINE **Intermediate Algebra with Review**

Course Description

MA 120. Intermediate Algebra with Review. 5 hours credit. Prerequisite: Placement score or MA 060 or its equivalent with a C or better. This course will enable the student to interpret mathematical symbols and notation, simplify expressions, factor polynomials, solve equations (including systems, quadratic and systems of linear equations) perform operations on radical expressions, write equations of lines and evaluate functions after a review of some topics from basic algebra. The student will begin to conceptualize abstract ideas.

Course Relevance

The concepts learned in this course will improve the student's math skills, leading to success in subsequent courses. The student's ability to think analytically will improve. Discipline, perseverance and the ability to follow directions are necessary for success, so these skills will also improve. Mathematical literacy will be increased, leading to informed choices when making decisions in life.

Required Materials

Lial, Hornsby, McGinnis. (2008). *Intermediate algebra* (10th ed.). Boston, MA: Pearson Addison Wesley Publishing Co.

Scientific Calculator: The student is responsible for the knowledge necessary to use any make of scientific calculator.

Supplemental Materials

Lial, Hornsby, McGinnis. (2008). *Intermediate algebra* (10th ed.): Student solutions manual. Video Lectures on CD with Solution Clips, Pass the Test: Chapter Solutions on Video with Interactive Chapter Summaries on CD, Additional Skill and Drill Manual, MathXL Tutorials on CD Boston, MA Pearson Addison Wesley Publishing Co. MathXL is used for online homework, tutorial and assessment purposes.

Learning Outcomes

The intention is for the student to be able to:

1. Use problem solving to be successful in future learning.
2. Use and interpret mathematical symbols and notation.
3. Perform mathematical procedures and techniques correctly.
4. Conceptualize abstract ideas.

Learning PACT Skills that will be DEVELOPED and documented in this course

Through involvement in this course, the student will develop ability in the following PACT skill area(s):

Analytical Thinking Skills

1. Problem solving
 - Through the process of learning to solve multi-step problems and real world application problems, the student will develop not only the general concepts involved in problem solving, but skills that can also be applied and transferred to real life analytical types of situations.

Communication Skills

1. Reception and interpretation of messages
 - Through the process of working through application problems, the student will develop the ability to interpret and evaluate real world application problems from text form into a mathematical equation.

Technology Skills

1. Discipline-specific technology
 - Through the use of scientific calculators, the student will learn basic skills involved in problem solving with the aid of visual graphs and immediate calculations that apply to mathematics and real world situations.

Major Summative Assessment Task(s)

These learning outcome(s) and the Learning PACT skill(s) will be demonstrated by:

1. Completion of the departmental final exam (A skill) which demonstrates a cumulative knowledge (C skill) of the material using a scientific calculator (T skill).

Course Content

- I. Skills/Competencies - Actions that are essential to achieve the course outcomes:
 - A. Factoring
 - B. Simplifying expressions
 - C. Solving equations
 - D. Modeling
 - E. Graphing
 - F. Simplifying radicals and expressions with exponents
 - G. Determining equations of lines
 - H. Operations with complex numbers
- II. Themes - Key recurring concepts that run throughout this course:
 - A. Solving equations
 - B. Simplifying expressions
 - C. Following directions
- III. Issues - Key areas of conflict that must be understood in order to achieve the intended outcome:
 - A. Recognizing which technique to use
 - B. Remembering prerequisite material
- IV. Concepts – Key concepts that must be understood to address the issues:
 - A. Notation
 - B. Variables
 - C. Graphing
 - D. Functions

Learning Units

- I. The real number system
 - A. Basic concepts
 - B. Operations on real numbers
 - C. Exponents, roots and order of operations
 - D. Properties of real numbers

- II. Linear equations and inequalities
 - A. Linear equations in one variable
 - B. Formulas
 - C. Applications of linear equations
 - D. Further applications of linear equations
 - E. Linear inequalities in one variable

- III. Graph and functions
 - A. The rectangular coordinate system
 - B. The slope of a line
 - C. Linear equations in two variables
 - D. Introduction to functions

- IV. Systems of linear equations
 - A. Systems of linear equations in two variables
 - B. Applications of systems in two variables

- V. Exponents and polynomials
 - A. Integer exponents and scientific notation
 - B. Adding and subtracting polynomials
 - C. Multiplying polynomials
 - D. Dividing polynomials

- VI. Roots, radicals and root functions
 - A. Radical expressions and graphs
 - B. Rational exponents
 - C. Simplifying radical expressions
 - D. Adding and subtracting radical expressions
 - E. Multiplying and dividing radical expressions
 - F. Solving equations with radicals
 - G. Complex numbers

- VII. Factoring
 - A. Greatest common factors; factoring by grouping
 - B. Factoring trinomials
 - C. Special factoring
 - D. A general approach to factoring
 - E. Solving equations by factoring

VIII. Quadratic equations

- A. The square root property and completing the square
- B. The quadratic formula

IX. Rational expressions and functions

- A. Rational expressions and functions (domain and writing in lowest terms)
- B. Complex fractions
- C. Equations with rational expressions and graphs
- D. Applications of rational expressions
- E. Variation

Learning Activities

Independent learning activities will be assigned to assist the student to achieve the intended learning outcomes. Activities identified in the syllabus, such as class discussion, lecture, reading, group work or projects will also contribute to learning.

Online teaching/learning activities such as posted web pages, discussions, assignments, exams and email interaction with the instructor will collectively assist the student to achieve course outcomes.

Grade Determination

The student will be graded on learning activities and assessment tasks. Grade determinants may include the following: daily work, quizzes, chapter or unit tests, comprehensive examinations, projects, presentations, class participation, and other methods of evaluation employed at the discretion of the instructor.