

COURSE OUTLINE

Intermediate Algebra

Course Description

MA 125. Intermediate Algebra. 3 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 rational equations), perform operations on radical expressions, write equations of lines and evaluate functions. The student will begin to conceptualize abstract ideas.

Course Relevance

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

Required Materials

Lial, M.L, Hornsby, J., McGinnis, T. (2007). *Beginning & Intermediate Algebra* (4th ed.). Boston, MA: Pearson, Addison Wesley

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

Supplemental Materials

Cole, J. (2008). *Student's solutions manual: Beginning and intermediate algebra* (4th ed.). Boston, MA: Pearson, Addison Wesley

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 Learning PACT skill(s) will be demonstrated by:

1. Taking a departmental common final exam (A skill) including open-ended questions that require conceptualization of abstract ideas (C skill) and accurate performance of mathematical procedures including the use of a scientific calculator (T skill).

Course Content

- I. Skills or Competencies – Actions that are essential to achieve the course outcomes:
 - A. Factoring
 - B. Simplifying expressions
 - C. Solving equations
 - D. Modeling
 - E. Simplifying radicals and expressions with exponents
 - F. 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. Linear equations in two variables

- G. Reading graphs, equations in two variables
 - H. Graphing linear equations
 - I. The slope of a line
 - J. Equations of a line
- II. Functions and variation
- A. Functions
 - B. Arithmetic operations on functions; optional: function composition
 - C. Variation
- III. Systems of linear equations
- A. Solving systems by graphing
 - B. Solving systems by substitution
 - C. Solving systems by elimination
 - D. Applications in two variables
- IV. Roots, radicals and root functions
- A. Radical expressions and graphs
 - B. Rational exponent
 - C. Simplifying radical expressions
 - D. Adding and subtracting radical expressions
 - E. Multiplying and dividing radical expression
 - F. Solving equations with radicals
 - G. Complex numbers
- V. Factoring
- A. The greatest common factor; factoring by grouping
 - B. Factoring trinomials x^2+bx+c
 - C. Factoring trinomials ax^2+bx+c
 - D. Special factoring rules
 - E. Solving quadratic equations by factoring
- VI. Quadratic equations
- A. Solving quadratic equations by the square root property
 - B. Solving quadratic equations by completing the square
 - C. Solving quadratic equations by the quadratic formula
- VII. Rational expressions and applications
- A. The fundamental property of rational expressions
 - B. Solving equations with rational expressions
 - C. Applications of rational expressions

Learning Activities

Classroom: 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: Online teaching/learning activities such as the following will assist the student to achieve course outcomes: posted web pages, threaded discussions, written assignments, assigned reading, and interaction with instructor through e-mail and discussion boards.

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.