

Fundamentals of Mathematics II Math 130B

Student Learning Outcomes

1. **The students will demonstrate factual knowledge including the mathematical notation and terminology used in this course.** Students will read, interpret, and use the vocabulary, symbolism, and basic definitions used in elementary algebra covering topics such as exponents, radicals, equations, inequalities, and polynomials.
2. **The students will describe the fundamental mathematical principles, generalizations, and properties arising from the concepts covered in this course.** Students will identify and apply the basic operations on the real numbers and the techniques used in solving a variety of types of equations and systems of equations.
3. **The students will apply course material along with techniques and procedures covered in this course to solve problems.** Students will use the facts, formulas, and techniques learned in this course to solve application problems in a variety of topics to include business, number relations, geometric situations, and proportions.
4. **The students will develop the basic skills and knowledge necessary to be successful in college-level mathematics courses.** Students will acquire a level of proficiency in the fundamental concepts of equation solving, algebraic manipulation, graphing, and applications to promote success in college-level math courses.

Course content

Textbook: *Developing Skills in Algebra*, Sixth Edition, by Nanney and Cable. The following chapters including particular sections listed are covered. (See textbook "Contents")

1. **Fundamental Concepts.** Addition, subtraction, multiplication, and division of real numbers; whole number exponents; algebraic expressions and combining similar terms; the product of a monomial and another polynomial; order of operations and grouping symbols; evaluating algebraic expressions; and using formulas.
2. **First-Degree Equations and Inequalities: One Unknown.** Techniques in solving first-degree and absolute value equations; solving first-degree and absolute value inequalities; and literal equations.
3. **Solving Word Problems.** From words to algebra; an introduction to solving word problems; distance-rate-time and mixture problems.
4. **Products and Factoring.** The product of polynomials; factoring polynomials: the greatest common factor, factoring by grouping, factoring trinomials, formulas for factoring special products, complete factorization; and long division of polynomials.
5. **Rational Expressions.** Simplifying rational expressions; multiplication, division, addition and subtraction of rational expressions; simplifying complex fractions; and rational equations.
6. **Exponents and Radicals.** The laws of exponents; integer and rational exponents; scientific notation; radicals, simplification of radicals; operations with radicals; and rationalizing denominators.
7. **Quadratic Equations.** Quadratic equations solved by factoring, completing the square and quadratic formula; solving incomplete quadratic equations; and word problems.
8. **Relations and the Cartesian Coordinate System.** Cartesian coordinate system; graphing equations and inequalities in two variables; functions; linear equations in two variables; solving systems of equations in two variables by graphing, substitution and addition; graphical solution of a system of linear inequalities; and the algebraic solution of three equations with three variables.