

COURSE OUTLINE

Mathematics 155 Arithmetic and PreAlgebra

Catalog Statement

MATH 155 is a basic skills course designed to prepare students for their first course in algebra. It includes the fundamental processes of arithmetic and pre-algebra. It is designed to develop skill in computation using whole numbers, fractions, decimals, percents, and properties of the decimal number system with an emphasis on the arithmetic of signed numbers. Rules of exponents, first-degree equations, fundamental facts about geometry with regard to area and perimeter are also included. Study and test-taking techniques related to mathematics are also covered.

Total Lecture Units: 3.5

Total Laboratory Units: 0.5

Total Course Units: 4.0

Total Lecture Hours: 56.0

Total Laboratory Hours: 24.0

Total Laboratory Hours To Be Arranged: 0.0

Total Faculty Contact Hours: 80.0

Prerequisite: Placement is based on a composite of test scores and academic background.

Note: This course may not be taken for credit by students who have completed MATH 255B or 144. A maximum of 4 units may be earned from any combination of MATH 255A, 255B, 255C, 255D, and 155. This course is Pass/No Pass only.

Course Entry Expectations

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

- read, write, and converse in English;
- use effective speaking and listening skills;
- read and write at a level of 10th grade or above;
- perform basic arithmetic operations of addition, subtraction, multiplication, and division of whole numbers;
- perform basic computer operations.

Course Exit Standards

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

- add, subtract, multiply, and divide whole numbers;
- add, subtract, multiply, and divide fractions;
- convert fractions to decimals;
- add, subtract, multiply, and divide decimals;

- convert decimals to percents;
- convert fractions to percents;
- find a percent of a number and what percent one number is of another;
- add, subtract, multiply, and divide signed numbers;
- use of the correct order of operation;
- use a calculator to perform arithmetic operations;
- evaluate expressions;
- add and subtract expressions;
- find area and perimeter of squares, rectangles, triangles and circles;
- solve equations using the addition property of equality;
- solve equations using the multiplication property of equality;
- solve first degree applications;
- apply test-taking strategies;
- use study skills related to mathematics.

Course Content

Total Faculty Contact Hours = 80.0

Whole Numbers (7 lecture hours, 3 lab hours)

Reading numerals and place value

Addition

Subtraction

Multiplication

Division

Factors and prime factorization

Exponents and order of operations

Rounding and Estimating

Fractions (7 lecture hours, 3 lab hours)

Reducing to lowest terms

Changing improper fractions to mixed numbers

Changing mixed numbers to improper fractions

Finding common denominators and least common denominators

Addition and subtraction of fractions

Addition and subtraction of mixed numbers

Comparing fractions

Multiplication of fractions, mixed numbers

Division of fractions, mixed numbers

Exponents and order of operations

Decimals (6 lecture hours, 2 lab hours)

Reading and writing decimals

Rounding decimals

Comparing decimals

Addition and subtraction of decimals

Multiplication of decimals

Division of decimals

Multiplying and dividing by powers of ten

Changing fractions to decimals

Changing decimals to fractions

- Operations with both fractions and decimals
- Order of operations
- Ratio and Proportions (4 lecture hours, 2 lab hours)**
 - Ratio and ratio applications
 - Solving proportions
 - Applications of proportions
- Percent (6 lecture hours, 2 lab hours)**
 - Meaning of percent
 - Changing percent to decimals
 - Changing decimals to percents
 - Changing percents to fractions
 - Changing fractions to percents
 - Solving percent problems
 - Applications of percents
- Strategies for the mathematics student (4 lecture hours, 2 lab hours)**
 - Learning styles and thought processes
 - Recognizing and combating negative thoughts
 - Effective studying and problem solving techniques
 - Effective test preparation
 - Test taking strategies
- Signed Numbers (8 lecture hours, 4 lab hours)**
 - Greater than and less than
 - Absolute value
 - Addition of signed numbers
 - Subtraction of signed numbers
 - Multiplication of signed numbers
 - Division of signed numbers
 - Order of operations
- Introduction to Algebra (8 lecture hours, 4 lab hours)**
 - Evaluating expressions
 - Simplifying expressions
 - Solving equations using the addition property of equality
 - Solving equations using the multiplication property of equality
 - Solving equation using both the addition and multiplication properties
 - Translating verbal expressions into algebraic expressions
 - Translating sentences into equations and solving
- Geometry (6 lecture hours, 2 lab hours)**
 - Angles and lines
 - Perimeter of plane geometric figures
 - Area of geometric figures
 - Volume of geometric solids
 - The Pythagorean Theorem
 - Similar and congruent triangles

Methods of Instruction

The following methods of instruction may be used in this course:

- classroom lecture and discussion;
- small group work and discussion;
- online video lectures.

Out of Class Assignments

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

- homework (e.g. problem sets related to course content);
- reading assignments (e.g. study skills related to mathematics).

Methods of Evaluation

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

- quizzes;
- five to eight chapter exams are required;
- a comprehensive final exam is required.

Textbooks

Martin-Gay, Elayn. *Basic College Mathematics. Glendale Community College Custom Edition*. 5th ed. Upper Saddle River: Pearson Education, 2015. Print.
10th Grade Textbook Reading Level. ISBN: 9781323144350

Bass, Alan. *Math Study Skills*. 2nd ed. Boston: Pearson Education, 2012. Print.
10th Grade Textbook Reading Level. ISBN: 9780321893079

Student Learning Outcomes

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

- perform arithmetic operations on whole numbers, fractions, decimals, and signed numbers;
- convert between percents, decimals and fractions;
- solve arithmetic, algebraic, and geometric application problems;
- calculate area and perimeter of polygons and circles, volumes of solids and solve similar triangle problems;
- solve proportions and linear equations;
- demonstrate knowledge of test-taking strategies and study skills.