



SYLLABUS

CATALOG DESCRIPTION

Course offers an in-depth look at the representations of rational numbers, including base-ten and decimal numbers, integers, fractions, arithmetic operations on these sets and number properties using student activities and investigations. Problem solving is emphasized throughout.

Prerequisites: Grade of “C” or better in MATH 096 or appropriate Accuplacer score

Semester Offered: Fall and Spring

Common Student Learning Outcomes

Upon successful completion of San Juan College programs and degrees, the student will demonstrate competency in...

BROAD AND SPECIALIZED LEARNING

Students will actively and independently acquire, apply, and adapt skills and knowledge with an awareness of global contexts.

CRITICAL THINKING

Students will think analytically and creatively to explore ideas, make connections, draw conclusions and solve problems.

CULTURAL AND CIVIC ENGAGEMENT

Students will act purposefully, reflectively, and ethically in diverse and complex environments.

EFFECTIVE COMMUNICATION

Students will exchange ideas and information with clarity in multiple contexts.

INFORMATION LITERACY

Students will be able to recognize when information is needed and have the ability to locate, evaluate, and use it effectively.

INTEGRATING TECHNOLOGIES

Students will demonstrate fluency in the application and use of technologies in multiple contexts.

Student work from this class may be randomly selected and used anonymously for assessment of course, program, and/or institutional learning outcomes. For more information, please refer to the Dean of the appropriate School.

General Learning Outcomes

Upon successful completion of the course, the student will be able to...

1. Rational Numbers and the Decimal System
2. Operations with Rational Numbers
3. Number Properties
4. Problem Solving

Specific Learning Outcomes

Upon successful completion of the course, the student will be able to...

- 1.1 Decompose numbers to demonstrate place value
- 1.2 Identify and define the whole numbers, the integers, and the rational numbers
- 1.3 Compare and contrast the various appropriate uses of whole numbers, integers, and rational numbers
- 1.4 Represent rational numbers using concrete models, number lines, and symbolic representations, and flexibly move between representations
- 1.5 Represent decimal numbers (including whole numbers) in different ways that demonstrate their place value structure (e.g. bundled objects and the number line).
- 1.6 Use concrete models number lines to demonstrate the equivalence of numbers, including equivalent fractions and fractions and decimals
- 1.7 Use concrete models and number lines to compare numbers
- 1.8 Explain procedures for rounding and comparing numbers using place value
- 1.9 Convey the relative sizes of integers, and rational numbers written as decimals and fractions

- 2.1 Recognize and produce appropriate definitions for addition, subtraction, multiplication, and division of whole numbers and rational numbers with particular attention to how these operations generalize from whole numbers to rational numbers.
- 2.2 Model addition, subtraction, multiplication, and division using concrete models and contextual situations.
- 2.3 Communicate the relationship among the operations
- 2.4 Identify an operation that applies to a given problem and explain why it is appropriate
- 2.5 Identify geometric models (e.g. area and volume models) used to represent numbers and operations
- 2.6 Accurately use standard and non-standard algorithms for the arithmetic operations of whole numbers, fractions, and decimals
- 2.7 Demonstrate and explain the relationship between place value, the properties of arithmetic, and the algorithms (standard and alternative) used for operations on decimal numbers including whole numbers.
- 2.8 Perform and describe strategies for mental computation and estimation using fact families, the structure of base-ten numbers, and the properties of arithmetic.
- 2.9 Evaluate computed answers for their reasonableness and give answers at an appropriate level of precision.
- 2.10 Use powers and scientific notation to express and compare large and small numbers

- 3.1 Illustrate the associative, commutative and distributive properties of arithmetic and demonstrate their use in common arithmetic procedures.
- 3.2 Recognize and produce appropriate examples demonstrating the importance of the properties of arithmetic fact fluency, estimation, problem solving, and algebra and that these properties apply to all branches of mathematics and at all levels.

- 4.1 Make sense of problems and persevere in solving them.
- 4.2 Reason abstractly and quantitatively.
- 4.3 Construct viable arguments and critique the reasoning of others.
- 4.4 Model with mathematics
- 4.5 Use appropriate tools strategically
- 4.6 Attend to precision.
- 4.7 Look for and make sense of structure
- 4.8 Use mathematical notation properly