Math 162 : Set Theory

California State University, Sacramento · Department of Mathematics & Statistics

An axiomatic study of set theory. Topic usually considered include: relations and functions; set theoretical equivalence; finite and infinite sets; cardinal arithmetic; ordinal numbers and transfinite induction; variants of the Axiom of Choice. Offered Spring only.

Catalog Description

Logic of mathematical proof, set theory, relations, functions. Examples and applications from set cardinality, algebra, and analysis. **Graded**: Graded Student. **Units**: 3.0.

Prerequisites

Math 31, Math 35.

Course Outline

  I. Paradoxes of set theory and the necessity of considering an axiomatic approach.

 II. Axioms and operations

III. Relations and functions

 IV. Natural numbers, Peano's postulates

  V. Construction of the rational and the real numbers (sketch)

 VI. Order and well order

VII. Induction and recursion

VIII. Cardinal numbers and the axiom of choice, Zorn's Lemma.

 IX. As time permits, ordinals and order types.