

(3-1-0; —)

**Fundamental Concepts in Elementary
Mathematics for Teachers**

MATH-010*

The course considers elementary school mathematics from an enriched point of view. Theoretical and pedagogical questions will be raised throughout the course, and students will be required to teach a one-hour enrichment class, once a week for 10 weeks, to grade 7 or 8 students in a local elementary school.

Textbook: *Course Notes*

sold through the University Bookstore, and written by the instructor.

Prerequisite: Permission of the instructor.

Instructor: L. B. Jonker

Evaluation:	Final Examination	15%
	Class Participation	15%
	Lab Reports	15%
	Homework Assignments	55%

Outline:

- **Enrichment material:** This material rotates on a two-year cycle: Geometry in even years and numbers in odd years.
- **The Numbers program:**
 - Number patterns and proofs
 - Prime factors
 - Rational and Irrational numbers
 - Modular arithmetic and divisibility tricks
- **The Geometry program:**
 - 3-dimensional geometry and the theorem of Pythagoras
 - regular solids and the Euler number
 - areas and perimeters
- **A critical examination of elementary mathematics:** This material is included every year, with concrete examples simulating classroom situations.
 - teaching for understanding
 - constructive learning in mathematics
 - connections to mathematics curriculum design
 - kinds of mathematical reasoning
 - the role of problems
 - abstraction in mathematics
 - mathematics as language