

(—; 3-0-0)

Advanced Elementary Number Systems

MATH-386*

This course is suitable for all students in a MATH Honours programme. It is one of the courses in the department's Teaching Focus.

Textbook: *Continued Fractions*

by C. D. Olds

MATH 386 Course Notes (selected readings)

Prerequisite: MATH-221*/223* or 280*/281* and 211 or 212*.

Instructor: M. Orzech

Evaluation:	Homework	20%
	Midterm test	20%
	Report (and possibly presentation)	20%
	Final exam	40%

Outline:

This course examines some fundamental properties of real numbers and related number systems, and the connection of these properties to calculus and to other mathematical topics encountered earlier by the students. Continued fractions, and ideas arising in their study, are used as a tool for representing and classifying real numbers (as rational or irrational, algebraic or transcendental) and as a vehicle for studying convergence of sequences and equivalent conditions for completeness of the set of real numbers. Time is spent outlining (with some detail) the development of the real numbers starting from Peano's axioms, with attention to the historical and mathematical significance of this project.

Students will work in a small group on a substantial independent study of one of several assigned topics. This work will be written up as a report, and as class size permits, each group will do a class presentation based on its work.