

Course Announcement

MAKING SENSE OF NUMBERS

Summer 2011

Professor Jeffrey Bergen - DePaul University

Scheduled meeting times are from 1 - 4:15 on
June 27, 29, 30 & July 6, 7, 11, 13, 14, 18, 20, 21

In the course we will examine similarities and differences between the following number systems:

Natural numbers, Integers, Integers modulo n , Rational numbers,
Real numbers, Complex numbers, Quaternions

We will use the properties of these different number systems to better understand topics that arise in high school courses in algebra, geometry, trigonometry, and calculus. This course will examine many of the following topics:

the well ordering principle, prime numbers, existence and uniqueness of prime factorization, parallels between integers and polynomial rings, using equivalence relations to define the rational numbers and the integers modulo n , showing that various objects (square roots, cube roots, n th roots, logs) are not rational numbers but are real numbers, rational roots of polynomials, divisibility tests, differences between the rational numbers and real numbers, the least upper bound property, the Intermediate Value Theorem, representing complex numbers and computing with them algebraically and geometrically, DeMoivre's Theorem, applications of complex numbers to number theory and differential equations.

Dr. Bergen has been a Professor of Mathematics at DePaul since 1981. He has been the director of DePaul's Master of Arts in Mathematics Education Program since 1996 and has recently published a textbook for preservice and inservice secondary mathematics teachers. For more information about this course, please contact Prof. Bergen at jbergen@depaul.edu.