MATH 204 — Mathematical Concepts and Structures I
Course Content Outline


NOTE: Problem solving, real life applications and mathematical connections should be infused throughout the course.

A. Problem solving (section 1-1) 2 hour
   - Polya's problem solving model
   - Strategies
   - Natural/Counting numbers (definition)

B. Numeration systems (section 3-1) 4 hours
   - The Hindu-Arabic system
   - Other number base systems (any bases from 2-12)
   - Whole numbers (definition, meanings of zero)

C. Whole number operations (sections 3-2 & 3-3) 8 hours
   - Addition (meanings, models, vocabulary, properties, CCSS problem types)
   - Subtraction (meanings, models, vocabulary, CCSS problem types)
   - Multiplication (meanings, models, vocabulary, properties, CCSS problem types)
   - Division (meanings, models, vocabulary, CCSS problem types)
   - Operations with zero
   - Order of operations
   - Exponents

D. Computation of whole numbers (sections 3-4 & 3-5) 7 hours
   - Estimation
   - Mental computation
   - Written computational strategies (standard and non-standard algorithms)

E. Number theory (chapter 4) 8 hours
   - Multiples/factors
   - Divisibility theorems
   - Primes/composites, odds/evens, relatively prime
   - Fundamental Theorem of Arithmetic, prime factorization
   - Divisibility tests (2, 3, 4, 5, 6, 8, 9, 10)
   - Greatest common factor
   - Least common multiple

F. Integers (section 5-1) 5 hours
   - Concepts (meanings, models, connections to set of whole numbers)
   - Operations (addition and subtraction: use models and meanings to make sense of rules, properties)
   - Comparing
   - Absolute value
G. Fractions that are rational numbers (sections 6-1 thru 6-3) 10 hours
- Concepts (vocabulary, definition/meanings, models)
- Operations and properties (use models and meanings to make sense of algorithms)
- Comparing (mentally and written)
- Estimation and mental mathematics
- Exponents

H. Decimals (chapter 7) 8 hours
- Concepts (vocabulary, definition/meaning, models, relationship to fractions and to place value)
- Operations (use models and meanings to make sense of algorithms)
- Estimation and mental mathematics
- Percents (meanings)

NOTE: Other topics may be included if time permits.

April, 2018