

# Bemidji State University

## MATH 3064: Number Concepts for Teachers

### A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: \*.\*

Lab Hours/Week: \*.\*

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course provides a background in number concepts that are pertinent to school mathematics. Topics include scientific notation, number sense, properties of integers, prime and composite numbers, divisors, GCDs, LCMs, the number of divisors, the sum of divisors, the Euclidean Algorithm, famous unsolved problems, finite mathematical systems, modular arithmetic, introductory graph theory and applications, permutations, combinations, sorting, congruences, sequences, direct and indirect proofs, mathematical induction, and traveling salesman problem and algorithms. Emphasis will be given to problem solving techniques as they relate to number concepts. Prerequisite MATH 1011 or equivalent or consent of instructor. Might not be offered every year.

**B. COURSE EFFECTIVE DATES:** 01/13/2014 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Application of discrete mathematics strategies including pattern searching; organization of information; sorting; case-by-case analysis; iteration and recursion; and mathematical induction to investigate, solve, and extend problems
2. Application of discrete models to problem situations using appropriate representations, including sequences, finite graphs and trees, matrices, and arrays;
3. Application of systematic counting techniques in problem situations to include determining the existence of a solution, the number of possible solutions, and the optimal solution;
4. Exploration, development, analysis, and comparison of algorithms designed to accomplish a task or solve a problem

### D. LEARNING OUTCOMES (General)

1. possess a sense for operations, application of properties of operations, and the estimation of results
2. understand number systems; their properties; and relations, including whole numbers, integers, rational numbers, real numbers, and complex numbers
3. possess an intuitive sense of numbers including a sense of magnitude, mental mathematics, estimation, place value, and a sense of reasonableness of results
4. be able to translate among equivalent forms of numbers to facilitate problem solving
5. be able to estimate quantities and evaluate the reasonableness of estimates

### E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

### F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted