



The University of Montana
Department of Mathematical Sciences
Summer 2010, Math 526
Discrete Mathematics for Teachers

On-line Course Dates: June 14 - July 16
Orientation Meeting: June 14 MA206 UM Campus (Suggested but Optional)
MA 206 UM Campus, Exact Time TBA

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Course Description: Discrete mathematics problems are all around us! We see them in areas such as layout of communication networks, positioning of satellites, scheduling of aircraft (which is why most of the planes that leave Missoula fly through Salt Lake City or Minneapolis), design of circuit boards, sizing of truck fleets, design of unbreakable codes, assignment of workers to jobs, design of bus routes (which is a focus of the Missoula company, Edulog), production planning, scheduling referees for major league baseball games, and investment planning. Recent technological advances have made it possible to solve (or approximately solve) many such large-scale problems. There has been an abundance of material written about discrete mathematics for use in middle and secondary schools. The course will be structured around various modules chosen from these sources. We will examine these modules, study the theory behind them, investigate related applications, and discuss the role discrete mathematics has in the K-12 curriculum.

Reference Material:

Discrete Mathematics Across the Curriculum, K-12, Margaret J. Kenney, Christine R. ;
Hirsch, Ed.; NCTM, ISBN: 0-87353-305-4
Graphs: An Introductory Approach, Robin Wilson, John Watkins;
Wiley, ISBN: 0-471-61554-4

Web Materials:

Mega Math <http://www.c3.lanl.gov/mega-math/>
CS Unplugged <http://csunplugged.org/>

Topics: Our focus will be on graph theory. The main topics we will cover are graphs and digraphs, Eulerian graphs, Hamiltonian graphs, path algorithms, trees, planarity and coloring, decomposition problems (including matching), The Traveling Salesman Problem, and complexity.

Goals for the Course: 1. Learn the fundamentals of discrete mathematics, 2. Enhance problem solving skills, 3. Develop the ability to communicate mathematics in both written and verbal form, and 4. Learn how to incorporate discrete mathematics concepts in the K-12 curriculum