Math 1120-001: The Spirit and Uses of Mathematics **Spring 2008**

Class Meetings: TuTh 8:00–9:15 PM, ECCR 155

Instructor: Tracy White e-mail: whitetl@colorado.edu

Office Hours: TuTh 9:30–10AM and Wed 4–6PM in MATH 242.

Prerequisites. One year of high school algebra and one year of geometry

Book. *A Problem Solving Approach to Mathematics for Elementary School Teachers*, 9th Edition, by Billstein, Libeskind, and Lott (Addison Wesley Longman)

The goals of the course. This is a mathematics course, but it's not. In other words, it's unlike most math courses. It will not just be about manipulating equations, memorizing and applying formulas, and the like, but rather about how to solve problems and clearly communicate their solution, and how to look at, and see, math's BIG PICTURE. Along the way, you will be exposed to some of the most beautiful ideas in mathematics.

ONE OF OUR PRIMARY GOALS IS TO HAVE FUN!! The most important BIG IDEA you can pass along to the youngsters you teach (if you're going to teach; if not it's still a great BIG IDEA) is that math can be, and is, fun. First, you need to believe it yourself. BELIEVE IT!! I'll do my best to convince you.

Whom the course is designed for. Prospective elementary school teachers; any student in the liberal arts who is interested in the material covered.

QRMS warning. This course is not the quickest or easiest way to fulfill the QRMS requirement of the College of Arts and Sciences! You need to take both Math 1110 *and* Math 1120 to get credit for the QRMS requirement. On the other hand, a course like Math 1012 satisfies the requirement in one semester.

REQUIREMENTS AND GRADES. Here is what you will need to do in this course:

1. Homework. This will be assigned, and due, roughly every two weeks. No late homework will be accepted, but *your lowest two homework scores will be dropped.*

On days that homework is due, we will spend most or all of the period going over homework in class. *Feel free to discuss homework with your groupmates* (see requirement #2 below). Do as much of the homework at home *before* the due date, so you can concentrate, in class, on problems that gave you difficulty.

Graded assignments will be returned in class. The homework will constitute **10%** of your course grade.

The first assignment, and due date, can be found at the end of this syllabus. Subsequent assignments will be announced in class.

Note that many of the exercises are solved in the back of the book. But please *do everything you can* to figure out the problem before referring to the solutions. On the other hand, it's a great idea to *check your work* in the back, once you're done.

2. In-class group worksheets. On numerous occasions (you can count on this at least once a week, maybe more), the last 20–25 minutes (sometimes more) of the class period will be set aside for you to work on problems related to the material. You will do this work in small groups consisting of yourself and three or so classmates. (The class roster, and therefore the groups, will fluctuate a bit during the first week or so; ultimately we hope to

settle down into groups of four or so.) This in-class work will make up another **18%** of your grade, with the lowest three worksheet scores being dropped.

3. In-class exams. There will be two during the semester, given on:

Thursday, February 21 and Thursday, April 3

respectively. Each exam will constitute **18%** of your final grade.

You will only be excused from an exam (including the final; see #5 below) in case of a *documented* illness or other emergency.

4. The GROUP term project. Here's your assignment: working TOGETHER with the other members of your group (which you will form in class over the first few weeks), be creative with math!! You have many options here, according to your talents, abilities, hobbies, and so on. If you like to write, you can write a short story or poem that involves math. If you're musical, you can write and/or perform a song with math lyrics. If you like to draw, you can do a picture that reflects geometrical ideas. If you like to build things, you can make a toy or machine whose workings involve mathematical principles. Etc.

The term project may be handed in *anytime* up to and including the last class on May 2. It will count towards **18%** of your final grade.

If your project is a performance piece (a song, a play, etc.), or if it's simply something you'd like to show the rest of the class, let me know in advance so we can try to schedule some class time for it near the end of the semester.

IMPORTANT NOTE: Each group member will be asked to grade the participation, on the term project, of the other members of the group. If you get really bad grades (or really good grades!!) from other members of your group, it may affect your term project grade. BE A GOOD GROUP CITIZEN! Don't force your group members to pick up your slack on the term project, or your term project grade may suffer for it!!

5. The final exam. It's on **Wednesday, May 7, 10:30am 1:00 PM**, in this room. It will constitute the remaining **18%** of your final grade. The final will *not* be cumulative.

6. Class participation. In borderline cases, class participation (not counting the mandatory group worksheets – see #2 above) will be taken into account in determining final grades.

7. General note: A commonly asked question is "Will my grades be curved?" The answer is yes, in the sense that your performance will be measured in relation to that of other students in the course. On the other hand, there are no rigid quotas of A's, B's, C's, etc.

Et Cetera Please refer to http://registrar.colorado.edu/calendar/calendar_spring08.html for various drop deadlines.

Please inform me should you need, due to your observance of a religious holiday, to miss an exam, class, or homework. Also inform me of any special consideration you might require due to a disability. I will do all I can to accommodate.

First homework assignment: due Thursday January 31

Please note that we are skipping Section 7.3.

Sec. 7.1 (pp. 443–447): 2, 4, 5, 10, 12, 15, 17, 21, 22, 23.

Sec. 7.2 (pp. 461–466): 1, 2, 3, 5, 8, 9, 12, 15, 18, 28.

Sec. 7.4 (pp. 482–484): 1, 2, 3, 5, 8, 12, 16, 18, 19, 23.