June 19, 2001

The CTL project has supported certain aspects of my development of a new course, MATH 5035/7035, Algebra for Middle School Teachers. Five aspects of the course have been especially molded by CTL principles. The first involves the development of problems whose content relates to students' everyday lives, which are suitable for group work as projects, which allow for multiple modes of inquiry (e.g., paper and pencil, spreadsheets, graphing calculators, etc.), which allow for multiple modes of solution (numerical, graphical, algebraic), and which therefore provide fertile ground for in class discussion and discourse concerning mathematics. The second aspect involves student development, alone or in small groups, of a project relating middle school algebra and everyday life, and of their presentation of this project to the whole class.

The third aspect, which to my knowledge is unique for an Arts and Sciences course, involves the integration of the context in which my students will work, an actual middle school classroom, into my mathematics class, in a way designed to enhance my students' appreciation of the need for a deep and profound understanding of the content they will be teaching. This integration of best practices from an actual middle school classroom into a university mathematics course will be accomplished by the requirement that my students participate in some aspect of the MathCounts competition. MathCounts is a mathematics contest for 7^{th} and 8^{th} grade students, sponsored by the National Council of Teachers of Mathematics (NCTM) and the National Society of Professional Engineers (NSPE). A local middle school teacher, who is an active and successful MathCounts coach, has agreed to cooperate with me to provide my students with a middle school MathCounts experience. Students will be required to choose several from among the following possibilities:

A. (required of all students) Work in small groups to solve some problems from the MathCounts contest.
B. Observe Mr. Bacchus and his students during a MathCounts coaching session.
C. Participate, in the role of middle school students, and working with middle school students, during one of Mr. Bacchus' MathCounts coaching sessions.
D. Take a few MathCounts problems and prepare a coaching session for fellow students in Math 5040.
E. Take a few MathCounts problems and prepare a coaching session for some of Mr. Bacchus' students in Math 5040.
F. Tutor a student on the MathCounts team.
G. Volunteer as assistants during a MathCounts competition (either regional or state).

The fourth aspect will be the analysis of actual middle school student work. This will involve both incorrect student work (for which my students will be expected to interpret and diagnose the middle school student's misperceptions) and, perhaps more importantly, correct but nonstandard middle school student work (for which my students will be expected to see that the work was correct and be able to explain why it was correct).

Finally, the fifth aspect of the course that has been influenced by CTL principles is the matter of assessment. In addition to the usual modes of assessment in a mathematics class, strong emphasis will be put on assessment of a student developed portfolio involving: (a) student writeups and class presentations of their projects relating middle school algebra to everyday life; (b) student written reports describing their involvement with MathCounts and reflecting upon both the mathematical and pedagogical aspects of their experiences; student diagnoses for both correct and incorrect middle school student work.

ATTACHED:

A. University of Georgia course description for Math 5035/7035, Algebra for Middle School Teachers
B. Syllabus for Math 5035/7035
C. Sample Problems developed for Math 5035/7035

Sincerely,

Elliot C. Gootman
Professor of Mathematics