

MATH 520 Algebra for Teachers

Summer, 2010 (June 14-18, July 9)

meets 9:00 - 12:00 and 1:00 - 4:00 pm in room 305 of the Mathematics Building.

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Course description:

The main purpose of this course is to explore the content of algebra from multiple perspectives (number structures, their properties, graphing), its place in the 5-12 mathematics curriculum (beyond algebra per se), and techniques for teaching algebra (exploration, conjecture, justification, the use of technology).

This includes three responsibilities:

1. Participants will gain familiarity and depth with a variety of curriculum materials and mathematical presentations that can be used to engage their students in algebraic investigations and problem solving approaches.
2. Participants will consider national and international student performance of middle- to high-school aged students on algebra items in order to gain a perspective about the importance of these topics in the mathematics curriculum.
3. Participants will organize classroom presentations and develop units of instructional material that could be used with their students.

Text and resources:

Papick, Ira J. Algebra Connections. Pearson-Prentice Hall, 2007.

The NCTM's Navigation Series on Algebra (four modules: K-2, 3-5, 6-8, 9-12).

Topic outline:

1. integer, rational, real, and complex number systems
2. polynomials and their operations
3. algebraic equations and solution methods
4. modular arithmetic and mathematical structures
5. groups, rings, vector spaces, and fields

Projects / Course Requirements:

There will be four assessment events:

1. One quiz over traditional algebraic topics.
2. Two **short reports**, which will include a presentation and a written page about an algebra teaching activity that you found or created. The most important feature of the short report is that it communicates some algebra that you have done and can share with others.
3. A plan for an **instructional unit**. This will be a collection of material that could be used by your students to develop an algebraic idea. A unit should have specific goals for teaching a selected algebra topic (or topics).