Survey of Mathematical Problems I

About the course

This course is designed primarily for current and prospective teachers of mathematics at the secondary school level or higher. The goals of this course are for you:

- to increase your mathematical knowledge and skills;
- to be exposed to the breadth of mathematics and to many of its interesting problems and applications;
- to know how to have fun with mathematics;
- to see the unity of diverse mathematical fields;
- to work creatively;
- to increase your competence with open-ended questions, with questions whose answers are not known, and with ill-posed questions;
- to know how to read and understand mathematics; and
- to know that, when students ask you a question, you will either know an answer or know where to tell them to look for an answer.

We hope that after completing this course, you will have an expanded perspective and renewed enthusiasm for mathematics that you can convey to your own students in the future.

This semester we will emphasize topics from finite and discrete mathematics, such as logic, probability, game theory, number theory, graph theory, algebra, and geometry. A continuation course next semester will concentrate more on topics from continuous mathematics (calculus, differential equations, and so forth).

The prerequisites for this course are a basic knowledge of linear algebra, modern algebra, and advanced calculus at the level of Math 222, Math 415, and Math 409 respectively.

Most of the reading assignments are contained in a course packet that you can purchase from the Copy Center at 1710 George Bush Drive (at the intersection with Texas Avenue).

The course meets once a week, on Tuesday evening, from 6:00 PM to 9:00 PM in room 155 of the Blocker building.

About the instructors

Harold Boas
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WR 1:00–2:00 PM

Sue Geller
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Office hours: TR 12:45–2:00 PM

Both instructors are also available by appointment.

About course policies

Grading

Grades will be based on regular homework, a project, class participation, peer evaluation, and possibly quizzes. The grading scale will be: A = did most of the work well; B = did most of the work adequately; C = did minimal work, F = failed to complete a substantial amount of the required work.

In lieu of a final examination during exam week, there will be a class meeting on Tuesday, December 10 (even though that Tuesday is officially a Thursday).

Homework

There will be a variety of types of homework: solving typical mathematical problems, reading, inventing problems yourself, doing projects, etc. Please read the selections in the course packet carefully and try to understand the details, including the proofs.

We encourage you to work together on homework; during class meetings, we will have formal working groups. Not only will each of you learn more by working together, but it will be more fun. However, you must each write up your own homework solutions individually.

Absences and late work

In-class activities are an integral part of this course, and since the course meets only once a week, you will miss a significant part of the material if you are absent. If an emergency forces you to miss a class meeting, please notify us in advance.

We expect you to come to class prepared and to turn in all assignments on time. If extraordinary circumstances arise that will pre-empt your work on our course, please make arrangements with us ahead of time.