

UNDERGRADUATE MATHEMATICS SEMINAR

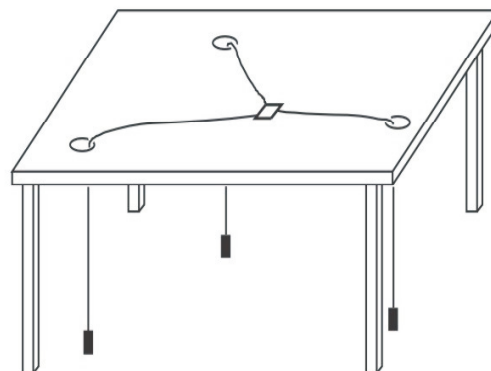
The next seminar will be this coming **Monday, May 12th**, with refreshments beginning at **4:00** in the Math Common Room, **Bailey 204**, and the lecture following at **4:15** in **Bailey 207**.

In this seminar, three speakers will share the hour: **Professor Bill Zwicker**, and undergraduates **Ronghua Dai** ('08), and **Ari Morse** (Skidmore College, '09).

TITLE: Rubber Bands, Pulleys, and Decisiveness in the Theory of Voting

ABSTRACT: Suppose we wish to compare several voting rules in order to decide which is “best.” We might consider criteria such as:

- **Expressiveness** Does a ballot convey information about a voter’s preferences among *all* candidates, or does it only identify the single, most favored candidate?
- **Manipulability** How easy is it for a voter to obtain a preferred election outcome by deliberately misrepresenting her preferences?
- **Decisiveness** How often does the rule result in a unique winning candidate, as opposed to a tie?



Decisiveness has been relatively understudied. We argue that it is an important property in its own right, and it is also crucial to consider the effect of decisiveness on attempts to measure manipulability. This summer Dai and Morse studied the decisiveness of two closely related voting rules, one based on the **mean**, and the other on the **median**. What does any of this have to do with pulleys or rubber bands? You’ll find out if you come to the talk . . .

Fall '08 Preregistration Process Begins this Weekend

The Timeline

- Petition course signup: Saturday, May 10th- Tuesday, May 13th. Log into webadvising.union.edu to request a slot in a petition course.
 - With the exception of honors projects, independent studies, and theses, all upper division math courses in the fall term are petition courses.
- Acceptance period: Monday, May 19th – Tuesday, May 20th. Log into webadvising.union.edu and change the ones marked “Faculty Approved” to “Student Accepted” if you wish to register for the course.
- Registration Period on Web at Hale House: Juniors on May 22nd, Sophomores on Friday, May 23rd and Monday morning, May 26th, First Years on Monday afternoon, May 26th and Tuesday May 27th.

The Courses

Next fall, the Math Department is offering several interesting courses beyond the calculus sequence that are suitable for math majors and minors.

Math 138 (Methods of Applied Math I) is an introduction to applied math that focuses on differential equations that arise from physical, biological, or economic phenomena. This course is required for the applied math major and has a Math 130 or 234 prerequisite.

Math 199 is the department’s “bridge course,” intended to help students make the transition from computationally oriented courses to more theoretical proof-writing courses. It is a **required** course for all math majors and minors that is *usually* taken after a student has taken Math 115.

Beyond Math 199: There are three courses being offered in the fall that have a Math 199 prerequisite: **Math 219** (Topics in Discrete Mathematics), **Math 336** (Real Variable Theory), and **Math 436** (Topology). As a 200-level course, Math 219 is appropriate for students coming from Math 199. Math 336 is **required** for math majors. In this course, you will learn some of the theory *behind* the computation that you learned in calculus. Math 436 is a good choice for advanced students who would like to earn honors in the major and/or are thinking about graduate school in math.

Headlines from the AMS

The American Mathematics Society has made the following announcements:

- "NUMB3RS MATH ACTIVITIES The Cornell University mathematics department has developed a series of materials on the math behind episodes of the TV show "Numb3rs." To date there are over 60 topics from the first four seasons, including "Counterfeit Reality," "In Plain Sight," "The Mole," "Pandora's Box," and "Tabu." Each topic includes a brief synopsis of the program's plot and how the mathematician character Charlie used math to solve the crime, a more in-depth look at the mathematics, and often a suggested activity or supplemental "Tangent." See <http://www.math.cornell.edu/~numb3rs/>."
- "WOVEN BEADS - A NEW ALBUM ON MATHEMATICAL IMAGERY Gwen L. Fisher, (California Polytechnic State University, San Luis Obispo) describes the mathematics involved in her woven bead creations: "Mathematically, many beaded beads can be viewed as polyhedra, with each bead (or, more precisely, the hole through the middle of each bead, which provides its orientation) corresponding to an edge of the polyhedron. Different

weaving patterns will bring different numbers of these "edges" together to form the vertices of the polyhedron. So it is very natural to use various polyhedra as the inspiration for beaded bead designs." See this album and others on Mathematical Imagery <http://www.ams.org/mathimagery/>.

Resources for Students 2008

- Looking for a Few Good Tutors Would you like to **become a tutor in the Calculus Help Center**? There will be fall term tutoring positions available. Potential tutors must have completed calculus through Math 115 with a minimum grade of A- in each calculus class. Though not necessary, preference will be given to students who are considering becoming teachers. If you are interested in applying for a CHC tutoring position, contact Professor Friedman in Bailey 107D, or email him: friedmap@union.edu.
- Actuarial internship The New York State Insurance Department in Albany "is looking for resumes for an actuarial internship that begins in September 2008. Applicants would preferably be a math major and have plans for a career as an actuary. The position is in downtown Albany, and resumes can be sent to Amanda Fenwick and Fred Anderson (FSA, MAAA) at afenwick@ins.state.ny.us and fanderse@ins.state.ny.us.

Problem of the Newsletter: May 9, 2008

Congratulations to **Schuyler Smith** for submitting a correct solution to last week's problem. You can view a winning solution on the bulletin boards in Bailey Hall.

Here is this week's problem: This problem was suggested by **Schuyler Smith**, who encountered it in the recent mathematics AIME I competition. "Ten identical crates each have dimensions 3ft x 4ft x 6ft. The first crate is placed flat on the floor. Each of the remaining nine crates is placed, in turn, flat on top of the previous crate, and the orientation of each crate is chosen at random. Find the probability that the stack of crates is exactly 41ft tall." Express your answer as a fraction in lowest terms.

Professor Friedman will accept solutions until 12:00 noon Thursday, May 15th. Email your solution to him (friedmap@union.edu) or put it in his mailbox in the Math Department's office.