

UNDERGRADUATE MATHEMATICS SEMINAR

The next seminar of this term will be this coming **TUESDAY, October 7th**. Refreshments will be served at **3:45** in the **Math Common Room, Bailey 204**, with the seminar beginning at **4:00** in **Bailey 207**.

The seminar will be given by *two* of Union Math Department's own, **Professors Davide Cervone** and **Bill Zwicker**. In the seminar, they will describe work on which they have collaborated, blending their respective expertise: geometry and interactive web-based software (Professor Cervone), and voting theory (Professor Zwicker).

TITLE: Voting with Rubber Bands and Pulleys

ABSTRACT: Whoever gets the most votes wins, so voting is simple, right? Not quite. A variety of very different rules have been proposed for *multicandidate voting*. Some of these rules have a voter cast a ballot listing all candidates in descending order of preference. Rules that take account of a voter's full ranking, rather than her first choice only, offer some advantages. Which rule we use certainly affects who wins the election, so the choice of rule is important. We'll look at two rules: one dating back to the French revolution (or earlier) and another that was proposed very recently. Each of these rules can be defined in terms of machines that use weights and pulleys, or rubber bands, although that is *not* the way they were originally described.

This mechanistic viewpoint gives us some insight into the different voting properties that might make us choose one rule over the other. That insight is enhanced when we play with the actual machines, in the form of interactive computer simulations of the rubber bands and the strings.

My Summer Experience, by William Manko '10

Over the summer of 2008, I was lucky enough to intern at a small actuarial firm called Actuarial and Technical Solutions (ATS), located in Ronkonkoma, NY. In the beginning of my sophomore year at Union College, I had a small interest in the actuarial field but didn't know too much about it. Luckily I knew someone in the actuarial field so I was able to talk to her about the pros and cons of her job. Unsure of which companies to apply for, she told me to send my resume to her company and see what happens. Her company was Actuarial and Technical solutions. In early 2008, I had a successful phone interview with the employer and I was soon told that I could intern there for the summer. I did apply to bigger companies at that time, but some of them wanted people who were juniors or older – I was a sophomore at the time.

On my first day interning at ATS, I had no idea what they would expect me to do, but rest assured, it became a comfortable atmosphere. ATS was a very small company with a staff of less than 14. Their field was property/casualty with a big portion dedicated to

worker's compensation. The actuarial technician staff was split up into junior actuaries and senior actuaries. Each intern worked under one junior actuary and they would essentially be responsible for your work. I was first given a large list of vocabulary terms that are frequently used in the field along with lengthy reading on ratemaking. I didn't understand too much at first, but constantly being in the atmosphere allowed me to grasp things eventually, so that many things came together. The best way I learned things was by working on many different projects even if most of what I did wasn't considered to be "actuarial".

As an intern, I actually worked closely with the entire team of actuaries. Since ATS was a small company and had many clients, everyone was always busy trying to complete various projects. The company itself was pretty versatile as well, being able to handle a multitude of different projects. The use of Microsoft Excel was very

important – almost everything was done on spreadsheets. My job was mostly to use Excel to compile all kinds of data to make progress move quickly. More specifically, most of what I did was summarize data, organize claims based on business line of accident or fund year/accident year, compute development factors and their averages, compute all the losses for a certain year, and similar kinds of tasks. Another responsibility I had was to check other people's work. Since I was only an intern, there weren't too many things I could check, but what I did check was correct calculations, correct footnotes on many reports, and any kind of error(s) in the data sent by clients. I also updated a lot of old files to 2009.

After my internship was finished, I felt that I could see myself doing something like this in the future. The field seems pretty large, so even if I did learn a lot, I'm sure it was only the tip of the iceberg. Taking and studying the exams won't be easy, but if you want to find a career where graduate school is unnecessary, then perhaps you might want to become an actuary. I was told having a master's degree wouldn't help much in this field. The time you would spend in graduate school could be spent studying for exams instead, and it's in fact much cheaper.

As for myself, I'm currently studying for the P-exam and would like to take it sometime in March. My main goal is to pass 2 exams before I finish Union. For next summer, I'm going to try interning at a bigger company, and perhaps experiment with the "Life" field of actuarial science.

Putnam Exam 2008: Get Ready!

Do you like challenging problems? Do you immediately seek out the Problem of the Newsletter when you receive this newsletter? Then you should consider participating in the **William Lowell Putnam Mathematical Competition**, what Time magazine called the "world's hardest math contest" (Dec. 22, 2002). Thousands of students from hundreds of colleges and universities across the U.S. and Canada take part in this one-day competition on the first Saturday in December each year. The competition consists of 12 challenging problems. Students are given six problems at a time in each of two three-hour sessions. Each problem is scored from 0-10, so the theoretical maximal score is 120. The typical median score is 0 or 1 point! (We did say it is *challenging!*)

Last year, Union's team did very well, with several students scoring well above the median.

This year's exam will take place on **Saturday, December 6th**. Although this is after the fall term ends, we can make arrangements for you to stay in your dorm room the nights before and after the exam, or possibly take the exam at an institution closer to your home.

If you think you might be interested in taking the exam, please contact **Professor Paul Friedman** at friedmap@union.edu by **Thursday, October 9th**.

Problem of the Newsletter

Unfortunately, no one submitted a correct solution to last week's problem. A solution has been posted on the bulletin boards of Bailey Hall.

Here is this week's problem: From *last year's Putnam Exam*: Find the least possible area of a convex set in the plane that intersects both branches of the hyperbola $xy = 1$ and both branches of the hyperbola $xy = -1$. (A set S in the plane is called *convex* if for any two points in S the line segment connecting them is contained in S .)

Solutions to this problem should be submitted to Professor Friedman by Noon on Thursday, October 9th, either by email (to friedmap@union.edu) or to his mailbox in the Math Department office on the second floor of Bailey Hall.