

UNDERGRADUATE MATHEMATICS SEMINAR

The next meeting of the seminar will be this coming **Thursday October 18**, with refreshments beginning at **3:45** in the Math Common Room, **Bailey 204**, and the lecture following at **4:00 in Bailey 201**.

In this week's seminar, **Professor Kelly Black** will present the following talk:

TITLE: Hey, You Kids! ...Turn UP that Noise!!

ABSTRACT: In some physical and economic systems noise can play a dominant role in the transient behavior of the system. Often times mathematical theories have been developed for the underlying distributions of the solutions for the systems but little theory is available for the transient solutions which is often the primary interest of the scientist/engineer/economist. Compounding this problem the methods used for the numerical treatment of noise are not well developed and are most often focused on additive noise. We discuss some of the background and motivation of the development of mathematical models of noise. We then examine a numerical scheme to approximate proportional noise in stochastic differential equations. Finally, the statistical properties of the numerical approximations of a simple model are examined.

Winter Term Scheduling: Petition Course Sign-Up Tuesday and Wednesday

This winter term, the Mathematics Department is offering several interesting courses beyond the calculus sequence that are suitable for math majors and minors.

Math 104 is the old Math 52. It is a (non GenEd) Introduction to Statistics. Students who might be interested in a career as an actuary or in financial mathematics should consider this course.

Math 128 is a calculus-based introduction to probability. Again, students who might be interested in a career as an actuary or in financial mathematics should consider this course. This course is also useful for prospective teachers.

Math 127 is a course in Numerical Methods. Topics include numerical approaches to differentiation, integration, and to solving differential equations. This course has a Math 115 prerequisite and students should also have a degree of fluency in some mathematical programming language.

Math 130 is a course in ordinary differential equations. This course is required for majors and minors in applied mathematics and has a Math 115 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. As such, it carries WAC credit. Further, it is requirement for all math majors and minors. Math 199 is *usually* taken after a student has taken Math 115.

There are four courses being offered this winter that have a Math 199 prerequisite: **Math 221** (Mathematical Cryptology), **Math 238** (Methods of Applied Math II), **Math 340** (Linear Algebra), and **Math 432** (Abstract Algebra II).

As a Level 1 course, Math 221 is appropriate for students coming straight from Math 199. Math 238 is the second term in an applied math sequence. Math 340 is a Level 2 course and is required for the applied math and standard math majors. Math 432, a continuation of Math 332, is a Level 3 course and is a good choice for students who wish to earn departmental honors and/or have interest in graduate school.

Each of the courses described above is a petition (card) course. You can sign-up on the web (<http://www.math.union.edu/>) for a card on Tuesday or Wednesday (the 16th, 17th). Results will be posted at the beginning of the following week.

Where Are They Now? Samphas (Sammi) Chhea '03

After four years in the “real world,” Union Math Major **Samphas Chhea** wrote to the editor of the newsletter with an update. What follows is a summary of her professional life since graduation, and includes some advice for minority (math majors) from New York City. Thanks, Sammi!

“I’m actually in investment banking now and just got promoted over the summer to Associate. After college, I took an internship with the New York State Housing and Finance Agency (NYSHFA) where I spent half the year at Bear Stearns and half the year at the NYSHFA. It was an internship in municipal finance that introduces you to the private side (investment banking) and to government. I had a hard time deciding what I wanted to do after college and instead of looking for a job, I looked for an internship that could get me in the door of investment banking. This was perfect and is only available to *minorities who are residents of NYC*.

“This internship led me an Analyst position at Banc of America Securities where I have worked for 3.5 years now. My hours there are pretty long ... typically from 9:30am to 10pm, or later, so you can imagine how much time I have left for myself. My hours are still long as an Associate and I am trying to find a way to balance life and work. It is a pretty intensive career.

“Having majored in Math definitely helped me in this career. Quantitative skills play a big part in my job, especially in solving for cash flow solutions and creating Excel models. I have to say, though, that I

can't remember all those Theorems I learned in college, but the approach to problem solving and the analytical skills that I developed are extremely useful.

“The private side of municipal finance involves “working with municipal authorities to finance their projects on a State, City or local level (bridges, highways, schools, stadiums, theater, housing, etc). I work specifically in the Housing sector ... with State Housing Finance Agencies to finance and provide ideas that create affordable housing. Specifically, we structure bonds and other securities that provide tax-exempt financing to State housing authorities.

“This is pretty much a short description of the field I am in. As an Associate, I am on a track to become an investment banker in municipal finance. My activities and education at Union College had a lot to do to with landing this job and being successful at it.

“One final note: the internship program that I discovered is a great way for minority students at Union to get into a career that is demanding, challenging, and prepares you to be successful in any job. To find out more about it, the description is available at

<http://www.nyhomes.org>.

“Please feel free to contact me again if I can contribute somehow to the Union Math Department activities!”

Problem of the Newsletter: October 15, 2007

Congratulations to **Brandon Bartell, Susan Beckhardt, Ronghua Dai, Tayyab Shaikh, and Schuyler Smith** for submitting correct solutions to last week’s problem. You can view a winning solution on the first floor bulletin board in Bailey Hall.

Here is this week’s problem: A classic game to play with a friend... In the game $G(m,n)$ for given integers m,n with $2 \leq m \leq n$, players A and B alternately subtract any positive integer *less than* m from a running score which starts at n . Player A starts, and the winner is the player who brings the score to zero. For a given m,n , there is always one player who can force a win. Find who, and explain how.

Professor Friedman will accept solutions to this problem until 12:00 noon Friday, October 19th. Email your solution to him (friedmap@union.edu) or put it in his mailbox in the Math Department’s office on the second floor of Bailey Hall.