Department of Mathematics

February 13, 2009

UNDERGRADUATE MATHEMATICS SEMINAR

The next seminar of the winter term will be:

DATE: **TUESDAY, February 17th**

Time & **3:45pm –** Refreshments in the Math Common Room, **Bailey 204**

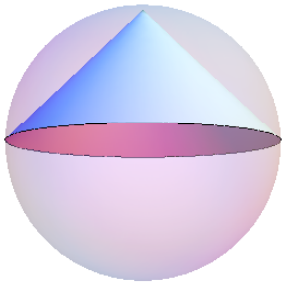
Location: **4:00pm –** Seminar in **Bailey 207**

In this seminar, **Professor Julius Barbanel** will continue his miniseries on Archimedes with:

TITLE: Archimedes' Mechanical Method

ABSTRACT: In 1906, Danish mathematical historian J. L. Heiberg made a remarkable discovery in a convent in Constantinople (now Istanbul). He discovered a 900-year old document written over many times, with remnants of early imperfectly erased writing still visible. Some of the writing was a copy of a much earlier letter written by Archimedes in the third century BC to his friend Eratosthenes (best known today for his very accurate measurement of the circumference of the Earth and for his method of listing primes). This letter contains what has come to be known as Archimedes' Mechanical Method.

The Mechanical Method uses the Law of the Lever ("Two weights balance at distances from the fulcrum that are inversely proportional to their magnitudes") to relate areas and volumes of various geometric objects. The technique involves something that looks very much like calculus. We shall present one of Archimedes' results using his Mechanical Method: A sphere has four times the volume of a cone with base equal to a great circle of the sphere and height equal to its radius.



Spring '09 Preregistration Process Begins this Weekend

The Timeline

(1) Petition course signup: Sat. Feb. 14th - Tue. Feb 17th. Log into webadvising.union.edu to request a slot in a petition course.

* With the exception of Math 102, honors projects, independent studies, and theses, all math courses in the spring term are petition courses.

(2) Acceptance period: Mon. Feb. 23rd – Tue. Feb. 24th. Log into webadvising.union.edu and change the ones marked "Faculty Approved" to "Student Accepted" if you wish to register for the course.

(3) Registration Period on Web at Hale House: Thur. Feb. 26th – Wed. Mar. 4th.

The Courses

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

Math 130 is a course in Ordinary Differential Equations. Math 115 is a prerequisite. A more theoretical version of this course, Math 234, is also being offered. Be aware that students, in general, may not take both 130 and 234.

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

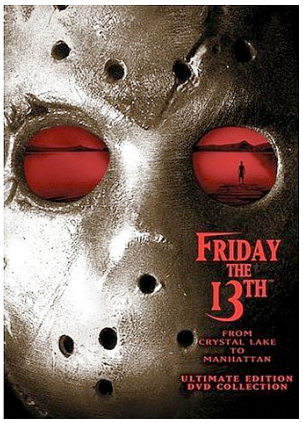
Math 115.

Beyond Math 199: There are four courses being offered this spring that have a Math 199 prerequisite: **Math 234** (Differential Equations), **Math 235** (Number Theory), **Math 332** (Abstract Algebra), and a new course, **Math 470** (Category Theory).

As 200-level courses, Math 234 and Math 235 are particularly appropriate for students coming from Math 199. [**Be aware** that Math 234 is not open to students who have passed Math 130.]

Math 332 is a beautiful course that generalizes what you know about algebra in the integers and real numbers to a more abstract setting. This course is required for the major. One should have had at least one 200-level course before enrolling in Math 332, otherwise permission of the instructor (Prof. Friedman) or the department chair is required.

Category Theory, Math 470, is the specialty of Prof. Niefield. Students considering graduate school in math or students who seek honors in the major should consider this offering. This advanced course has as prerequisites either Math 336 and 432, or Math 332 and 436, or permission from Prof. Niefield.



Got *paraskavedekatriaphobia?*

Scholarship Opportunity Knocking

Are you interested in the property/casualty actuarial profession? The Casualty Actuaries of Greater New York (CAGNY) is offering a scholarship for the 2009-2010 academic year. It is available to students who "have demonstrated high scholastic achievement and strong interest in pursuing an actuarial career in the property/casualty insurance industry." Two years ago, a Union College math major, Jessica Rudin '08, won this scholarship. Will you be the next Union recipient?

For more information, including an application, go to http://www.casact.org/affiliates/cagny/. In addition, Eric Hornick (Union '86) of Oliver Wyman Actuarial Consulting, Inc., is willing to talk with any interested students about this opportunity. For Eric's contact information, please see Prof. Friedman.

Problem of the Newsletter: February 13th, 2009

Congratulations to **Andy Mackenzie '09**, **Schuyler Smith**, and **Martin Schreiner** for correctly solving last week's Problem of the Newsletter. A winning solution has been posted on the bulletin boards in Bailey Hall.

Here is this week's problem: In how many ways can Alice, Bob, Charlie, David, and Eve split 18 marbles among themselves so that no two of them have the same number of marbles? (Schuyler Smith, who attacked it on a combinatorics test in a recent math competition, suggested this problem.)

Professor Friedman will accept solutions to this problem until 12:00 noon Thursday, February 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.