UNDERGRADUATE MATHEMATICS SEMINAR

The next seminar will be

DATE: MONDAY, October 18th
Time & 4:15pm – Refreshments in the Math Common Room, Bailey 204
Location: 4:30pm – Seminar in Bailey 207

In this seminar, Professor Kimmo Rosenthal of the math department will present the following talk:

TITLE: Adjoints – The Power of Abstraction

ABSTRACT: We will discuss the mathematical concept of adjointness (taken from category theory). The notion of adjoints appears throughout mathematics, even at the level of Math 199. We will begin by discussing examples involving partially ordered sets and Math 199 material and then gradually work our way through examples from linear algebra, abstract algebra, and more. The reason behind certain important mathematical constructions such as that of tensor product for vector spaces, free groups, commutator subgroups, and the Stone-Cech compactification will be touched on. The goal will be to argue that sometimes what may seem to be a very high, perhaps unnecessary, level of abstraction can reap unforeseen benefits in special cases.

Winter ’11 Preregistration Process Begins this Weekend

Preregistration for Winter 2011 courses begins with the petitioning process this weekend. If you have not already done so, you should read through the list of courses being offered this winter and consult the Academic Register to read course descriptions. It is also recommended that you consult with your academic advisor, if you have not yet done so. Here is an overview of the preregistration process, and a list of the math courses being offered this winter.

The Timeline

- Registration Period: online at Hale House (Closed 12-1 for lunch):
  o Seniors
    o Fri. Oct 29th, 9:00 am – 4:00 pm
  o Juniors
    o Mon. Nov 1st, 9:00 am – 4:00 pm
  o Sophomores
    o Tue. Nov 2nd, 9:00 am – 4:00 pm
    o Wed. Nov 3rd 9:00 am – 11:45 am
  o First-years
    o Wed. Nov 3rd, 1:15 pm – 4:00 pm
    o Thu. Nov 4th, 9:00 am – 4:00 pm

(See page 2 for Winter Term Math Courses)
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 130 is a course in Ordinary Differential Equations. This course is a more computational version of Math 234, a spring term offering. Note that students may only take one of these two courses.

Math 138, Methods of Applied Math I, will deepen your knowledge of differential equations and how they are used to model physical, biological, and economic phenomena. One of the differential equations courses, Math 130 and Math 234, is a prerequisite for this course.

Math 177 is a new course whose description is not in the Academic Register, so it is repeated here: A study of crucial events and ideas in the history of mathematics from ancient to modern times. In tracing the formation of arithmetic, geometry, algebra, trigonometry, calculus, and higher mathematics from the earliest surviving texts up through the twentieth century, we will explore the origins and evolution of fundamental mathematical concepts such as written numerals, symbolic notation, deductive proof, infinity, and limits, as well as their links to various practical applications from astronomy to military technology. This course is especially recommended for students considering a possible career in math or science teaching. Students must have completed the basic calculus sequence up through MTH-115 or its equivalent in AP credit.

Math 197, Discrete Mathematics for Computer Science, is a course that introduces (continued) students to the basics of proof-writing for math and computer science, and also covers elementary logic, functions, relations, sets, and basic combinatorics. This course is intended for computer science students; students considering a math major or minor should take Math 199, not Math 197.

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 224 (Geometry), Math 340 (Linear Algebra), and Math 448 (Differential Geometry). As a 200-level course, Math 224 is appropriate for students coming straight from Math 199. Math 340, a foundational course in math, is required for math majors. Math 448 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.

Problem of the Newsletter: October 15, 2010

Congratulations to alumnus Andy MacKenzie ’09 for solving last week’s irrational math bomb problem. A solution to the problem has been posted on the bulletin boards around Bailey Hall.

Here is this week’s problem: Here is one that Math 199 students and Math 235 students should enjoy: Prove that for all natural numbers $n \geq 1$, the number $n^3 - 9n^2 + 20n$ is divisible by 6.

Professor Friedman will accept solutions to this problem until noon Thursday, October 21st. 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.