

UNDERGRADUATE MATHEMATICS SEMINAR

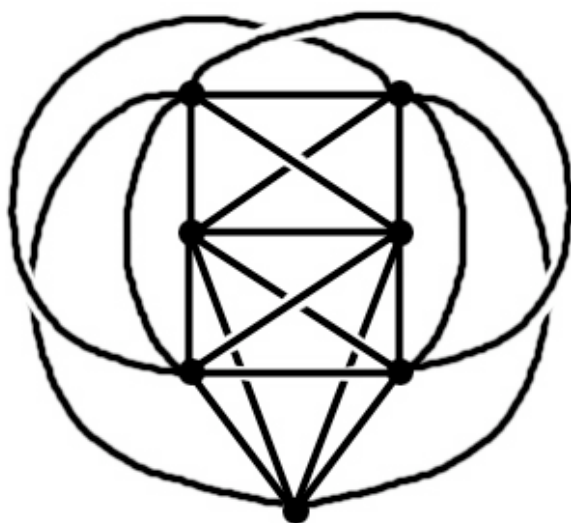
Bookmark it! The seminar schedule, abstracts, and (sometimes) slides presented by a speaker can be found on a webpage maintained by **Professor Jue Wang**: <http://www.math.union.edu/~wangj/seminar08f.htm>

The next meeting of the seminar will be this coming **MONDAY, October 13th**, with refreshments beginning at **4:15** in the Math Common Room, **Bailey 204**, and the lecture following at **4:30** in **Bailey 207**.

In this seminar, recent Union College graduate and current University of Albany graduate student, **Susan Beckhardt '07**, will be presenting the following talk.

TITLE: Knot a Graph? Why Not?

ABSTRACT: Pick seven points in space and connect each pair of points with a curve, and what you get is a spatial embedding of K_7 , the complete graph on seven vertices. Further, no matter how you arrange the vertices and edges, we can always find a closed path that is tied in a knot. A graph with this property, that every spatial embedding has a knotted cycle, is said to be intrinsically knotted. In 1983 John Conway and Cameron Gordon proved that K_7 is intrinsically knotted. We'll discuss their proof, which requires no background other than some basic combinatorics, and explore some of the intriguing results and questions that have arisen since then.



An embedding of K_7 (See this week's PON for more on this!)

Where Are They Now? Bilal Mahmood '08

This August I began my career as a medical student at Dartmouth Medical School in Hanover, NH. Medical school isn't a very common path for math majors, but there are one or two students every year considering medicine as a career. A major negative when compared to graduate school is the fact that you will be paying your way through, and collecting a lot of debt over the four years. In addition, there are very few scholarships when compared to undergraduate education, making it even more financially daunting. Personally, I try to see the positive side of this; looking at it as an indentured servitude which guarantees that we will have competent doctors in the US at least for their first few years (or decades) of practicing. Paying off medical loans while volunteering abroad would be somewhat challenging.

The biggest change between the undergraduate

years and medical school does not seem to be academic. Living alone for the first time is the immediate difference that comes to mind. I actually have to feed myself, and keep the apartment clean. Up until a week ago I had mostly been eating a combination of granola bars and peanut butter sandwiches. Now, I have a George Foreman grill so I have added meat to my repertoire of foods. Along with my rice maker, I can make some sort of rice/meat combination dish. Also, after eating, I actually have to wash the dishes and keep the kitchen clean. So it is a combination of all these chores that make it seem like I have a lot less time to spend on academics than I did at Union (if I had chosen to do so).

I don't mean to down play the great workload in academics. This term I am taking four core classes: biochemistry, anatomy and embryology, histology,

and physiology. Now, I was a math and physics major coming out of Union, so physiology is the course that has the most overlap with what I studied as an undergraduate. It has a lot of physics concepts that are inherently related to math in the quick abstract thinking that comes in handy. Anatomy has been very interesting as well, and going into the anatomy lab and seeing all the structures we are studying really helps with reinforcing all the material. Plus, real structures are different that all the drawings in the books, and getting used to using all the instruments correctly makes us feel like we are actually learning skills as well. There is a learning curve in anatomy, and after a few weeks it is amazing how we can quickly identify a small nerve on our own without confusing it with all the other “gunk” that is in the way. Biochemistry and histology are pretty standard, but we probably go somewhat faster than undergraduate courses. Histology lab also has a learning curve and only recently (after almost a month and a half) have we started noticing small differences between different cells, different types of cartilage, and all other microscopic structures under the microscope. To a large degree many cells do still look the same to everyone, but we are definitely improving. As a professor said to us today, when we were looking for lamellar bodies in type II, surfactant producing, alveolar cells: “you just have to look in the microscope until you start hallucinating, and then you see them.”

Along with these classes, I have also begun working with a preceptor who is a general internist at Dartmouth’s hospital. I work with him for half a day every other week. The first day I went I simply shadowed him. But starting on my second visit I was already seeing patients alone. When my preceptor is with his first patient, I go see his next patient and do whatever I have learned so far in a course we are taking to complement these visits. Then my preceptor joins me, we go over some things together and complete the case. So far I have mostly been taking histories and getting information on the presenting problem by myself. But over the next two years, while we are in our basic sciences, we begin to take all types of physical examinations in this course so we are hopefully well trained before our first clinical rotation in the third year.

Overall, I am enjoying all the courses. The school is half the size of most medical schools, so I think the student-professor relationships are stronger than at other medical schools. I was surprised when professors were calling us by name in the large lecture setting on the second day. At the same time, you’ll have to realize that coming from Union you are comparing these relationships to very strong student-professor relationships that are formed at a school like Union. The area is rural compared to Union, but there is a lot going on at the college. Time seems to be the main hindering issue for medical students to participate in all of the college activities. I still make time for things I enjoy, and have not given up pick up basketball or sleep. I am living in graduate housing with three other graduate students. They all like their programs, and I think a lot has to do with the small size of the departments compared to bigger universities. If anyone is considering Dartmouth for graduate school, medical school, or business school, feel free to contact me at bilal.mahmood@dartmouth.edu. There is plenty of room in my apartment, and I’ll keep the George Foreman ready.

Problem of the Newsletter: October 10, 2008

Congratulations to **Schuyler Smith** for correctly solving last week’s Problem of the Newsletter. His solution has been posted at the Math Newsletter sites on the bulletin boards around Bailey Hall.

Here is this week’s problem: Along with her abstract, this week’s seminar speaker suggested the following Problem of the Week: The illustration by her abstract on Page 1 is an embedding of K_7 (provided by Conway and Gordon) in which one Hamiltonian cycle is a trefoil knot and the rest are trivial. She asks you to find the trefoil. Her question comes with a warning: she has not yet been able to locate it! Good luck!!

Professor Friedman will accept solutions to this problem until 12:00 noon Thursday, October 16th. 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.