Message from the Chairperson

Here we go again! One of the pleasures of the academic life is its cyclical nature. It’s not exactly periodic like our friends the trigonometric functions, but there’s a sense of a new beginning every fall semester, sort of like Mother Nature starting over every spring: continuity from the past, but opportunities for something different. It’s almost like each new semester is the next segment of a piecewise continuous function: not quite a do-over, but a chance to give a new shape to the next piece of the academic career you’re graphing. We see those fresh-faced first-year folks slowly shift into seniors with eyes firmly planted on the finish line, with some mix of anticipation and anxiety. Those of us who stay here when the students grow and move on delight in seeing your progress and are always amazed at how each of you puts your own stamp on your journey through this place. May this next part of your graph be smooth and filled with maxima and minima of appropriate types!

Upcoming Events and Dates

October 8th—Midterms
October 11–October 17 Fall Break
October 22—Advising Begins—make an appointment with your advisor
October 23–24 - Homecoming!
November 5–7—Special Olympics Weekend
November 10th—Last Day for Withdrawal (without penalty)
November 23–28—Thanksgiving Break!

Be sure to make an appointment with your advisor to plan your courses for next semester!
Math Club News

The Math Club got together for a meeting on September 28 and made multiplication flash cards. The cards will be donated to two third grade classes at the L. P. Hill School in Philadelphia. The teachers will use them as a classroom activity and then the students will have the cards to take home to help them with their homework. Thank you Math Club members!!!

Stay tuned for information on the 2010-2011 Math T-Shirt!!!

New Faculty Join the Mathematical Sciences Team

Caitlin Condon, freshman math major, interviewed our two new math teachers. Here's what she found out.

Dr. Amanda Knecht went to Texas Christian University for her B.S. and Rice University for my Ph.D. When asked why she became a teacher, Dr. Knecht said, "The math professors I had freshman year were really cool and funny, and I wanted to be just like them. Then the more math I learned, the more I loved it and wanted to share my enthusiasm with others." Dr. Knecht has taught Calculus, Differential Equations, Linear Algebra, Cryptology, Coding Theory, and Computational Algebraic Geometry. Next semester she will teach Complex Analysis for the first time. Her favorite hobby is practicing Vinyasa Yoga and reading about the spiritual aspects of yoga. She also enjoys playing disc golf and watching TCU and LSU football, Yankees baseball, and NASCAR races. Since moving to the area, her and her husband joined the Art Museum and try to go every other weekend.

Dr. Jennifer Paulhus got her undergrad degree from the College of the Holy Cross and got her PhD from the University of Illinois at Urbana-Champaign. The last 3 years she has been a postdoc at Kansas State University. When asked why she became a teacher, she said, "I always have loved math so it seemed natural to go to grad school once I finished my bachelor's degree. As a teaching assistant in grad school I realized that I really loved explaining math to my students and the satisfaction of seeing them get a concept for the very first time." Dr. Paulhus said her favorite undergraduate subjects to teach are number theory, abstract algebra, and combinatorics. In her spare time, she loves to garden and bake (cookies and desserts in particular) and she enjoys playing video games.

Math Learning Resource Center Information

Where: Old Falvey 2nd Floor (near the Writing Center)
Hours: Sunday 6:30-9:00pm, Monday—Thursday 1:00—5:00pm and 6:30-9:00pm
Phone: 610—519—MLRC
Voicemail: 610—519—5193
Web Address: www.villanova.edu/mlrc

Walk-in Tutorial Services ~ No appointment needed
Private Tutorial Service ~ 20 minute sessions ~ Call to set up appointment
Spring 2011 Electives

- **MAT 4310 Statistical Methods** – Dr. Joseph Pigeon
  This course is an introduction to data summarization and various statistical methods that will allow students to begin to build up a toolbox of statistical techniques for handling data analysis. The class will study probability distributions that will serve as the foundations for these methods. The statistical methods that the class will study include point estimates, interval estimates and hypothesis tests for population means, variances and proportions, categorical data analysis, regression and correlation.

- **MAT 5400 Complex Analysis** – Dr. Alan Gluchoff (counts as a 2nd analysis course)
  Algebra of complex numbers, analytic functions, Cauchy-Riemann equation, Laplace equations, conformal mapping, integrals of complex functions, Cauchy's theorem, power series, Taylor's theorem, Laurent's theorem, residues, entire functions.

- **MAT 5705 Math Statistics II** – Dr. Michael Levitan
  Survey sampling, parameter estimation, hypothesis testing, two sample tests, analysis of categorical data, linear least squares

- **MAT 5920 Topic: Chaos** – Dr. Douglas Norton
  We will begin with a survey of topics from discrete and continuous dynamical systems, including: iteration of real and complex functions, qualitative questions about differential equations, fractals, and the idea of chaos. Students will do projects. Projects can be abstract or applied, theoretical or computational, topological or analytic or algebraic, involve computers or be computer-free, selected from across the wide range of dynamical systems topics.

- **MAT 5930 Topic: Coding Theory** – Dr. Andrew Woldar
  It's not hard to imagine a world without coding theory. Simply imagine a world bereft of all forms of digital technology, that is to say, no computers, no DVD or CD players, no mobile, cellular or gaming devices, etc. The problem arises due to physical limitations on circuitry and channel reliability. These cannot be avoided, and they manifest as inaccuracies in digitally transmitted information. Decades ago, when processors were capable of carrying out only a few hundred instructions per second, a computer (in the absence of coding theory) could run for perhaps several minutes before shutting down. Picture this same situation today, allowing for the fact that modern processors are capable of carrying out over 500,000,000,000,000 instructions per second. The machine would never even turn on. The reason it can, and does, is due to coding theory. In this course we study the mathematics underlying the design and development of codes, starting with the more naive early ones and moving progressively to the more sophisticated ones (for example, those used in the NASA Space Program).

- **MAT 5900 Seminar: Topic: Monte Carlo Methods** – Dr. Klaus Volpert & Dr. Jesse Frey
  Monte Carlo methods are methods for answering questions via simulation. They are widely used in finance, statistics, and many other fields. Students who take this course will learn how to design Monte Carlo studies, how to implement them using the statistical software package R, and how to appropriately assess the error in Monte Carlo estimates. Each student will complete a major project that involves the use of Monte Carlo methods.

Undergraduate Opportunities ~

The Math Office keeps a binder of information received by them related to student internships, summer opportunities, REUs, and undergraduate conferences. Feel free to stop by anytime to check it out. Also, Marie O'Brien sends emails to all undergraduate math majors whenever mailings come into the office.

Meet the Department of Math Sciences Staff:

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Department Phone: 610-519-4850
Department Fax: 610-519-6928
Email: math@villanova.edu

Staff:

Marie O'Brien
610-519-4809
Marie.obrien@villanova.edu

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What are our Math Graduates doing with MATH Now?

At the end of the Spring semester, Dr. Norton conducts exit interview with all of our graduating seniors. Seniors report what their plans after graduation are. Some plans include:

- Nine students plan to continue studies at Villanova University in the graduate program for Applied Statistics (5), Mathematics (2), Finance (1), and Secondary Education (1).
- Attending Graduate school for Secondary Education at Northwestern University. Eventual goal would be to work in the field of public education reform policy or education advocacy.
- Plans to do a year of service in Ecuador. After the year, will go to graduate school.
- Plans to attend graduate school in mathematical or theoretical physics.
- Two students will be taking the actuarial exams and pursuing a career as an actuary.
- Doing Volunteer and mission work in India.
- Job at Accenture as an analyst in the Technology Growth Department.
- Interviewing for jobs and looking into the actuarial and consulting field.
- Job at Lockheed Martin in Moorestown, NJ as an associate member of the engineering staff.
- Plans to attend graduate school with eventual goal of attending veterinarian school.
- Job as an actuarial analyst at Milliman, Inc. in Wayne, PA.
- Job as an actuarial analyst at Mercer in New York, NY.

What is GoNOVA and NOVA Network?

Need Internship Information ~ Use GoNOVA

GoNOVA is Career Services’ primary job posting resource and also manages the On Campus Recruiting Program. If you are interested in getting additional information about internships for positions that have been approved for academic credit, use GoNOVA.

http://www.villanova.edu/artsci/college/internships

The NovaNetwork is an online community exclusively for Villanova Alumni and can be useful to undergraduates. The NovaNetwork now offers enhanced features including Career Connections—with a searchable database of alumni including networking, advising and resume posting. To Villanova first year, sophomore, and junior students: In order to join the Villanova University Alumni Association, go to the following web address: http://www.alumniconnections.com/oc/pub/VLN/register/register.cgi

When asked to enter your first and last name and class year, only enter your first and last name. Disregard the box that asks for your class year. Click “Find My Record.” Then, click on your name and follow the directions in order to set up your account and profile. This account will allow you access to the Career Connections aspect of the Nova Network. As freshman, sophomore, and junior students, you will only have limited access to what is offered on the Nova Network. Senior students and alumni are granted full access to the Nova Network. It is a great database for seniors to connect with former graduates and search for jobs, etc.

Alumni News

Hello Villanova Mathematicians!!

I hope everyone is enjoying the fall semester so far and taking advantage of all that college has to offer. I think about Villanova all the time these days! Work doesn’t allow me to meet my friends for lunch at the Oreo, or celebrate Pi Day in SAC (I did try to recreate it in my office last year but it just wasn’t the same), or watch the Wildcats crush their competition at Kelly’s. The transition from college to the real world has certainly been a challenge, but I will say that it has been a great learning experience. My degrees in math and business have been a big help in developing my career and providing me the ability to take advantage of new and exciting opportunities. After graduation, I took a job in the space and satellite industry with Lockheed Martin Space Systems Company. I am a program financial analyst for our government programs, and since Lockheed Martin is primarily an engineering-based company, I work with math, science, and technology every day. I support all of the engineers who work on our government programs, which means I had to become a pseudo-engineer myself and be able to understand the ins and outs of the product we provide our customers as well as the real engineers do in order to work with them successfully. Most of the math I use on a daily basis involves geometry and optimization problems, rate analysis, and statistics. I incorporate all of the data and test work that the engineers perform in my analyses to make sure we are on schedule and on cost for all of our government programs, a job I never pictured myself doing when I was still in school, but one that I really enjoy now!

And of course every now and then, I get calls that start out with “Hey, you were a math major, right? Can you help me with this?” Those calls are always my favorite!

A lot has changed in my life post-Villanova, but I can say with confidence that I take Villanova with me wherever I go, every single day. If nothing else, being a math major taught me how to think critically, a necessary skill in the industry I work for now. I may be a little biased, but we are products of the best department on campus, so take advantage of those classes and learn all you can! And by all means don’t forget to have as much fun as possible. Sleep in and only sign up for afternoon classes, take Fridays off, play Frisbee in the Quad, order from Campus Corner at 2am... You get the idea. I wish you all a happy, healthy, safe, and successful semester, and please don’t hesitate to contact me if you need anything!

Keepin’ it real,

Jennifer Lee Patch, Class of 2009  Email: jennifer.lee.patch@lmco.com