



## HAPPY FALL FROM THE DEPARTMENT OF MATHEMATICAL SCIENCES

### **How Do I Get My Pin Number?**

#### **Everything You Need to Know About Spring Registration**

It's the week after fall break and you know what that means. That's right, it's time to register for the spring semester! Many of you old dogs know the drill. However, for the freshmen and those of you that forgot, here is a recap of the registration process. The registration period starts Tuesday, November 1<sup>st</sup> and ends Wednesday, November 9<sup>th</sup>. The seniors are the first to register. The juniors follow the seniors, then the sophomores follow the juniors, and last but not least the freshmen follow the sophomores. Sorry freshmen, but your day will come. Remember: **You can't register for anything without your PIN number, and only your advisor has that!!** Prior to your registration date, you must set up an appointment with your advisor. During this appointment, you will discuss course options for the spring semester. Therefore, please attend the meeting with some level of preparation in terms of the courses that you want to take. After your advisor makes sure that your proposed schedule will keep you on target to graduate (this would seem to be important), you will receive your PIN number. Once your scheduled registration time arrives (that time can be found in your NOVASIS account under 'registration'), you can register for your classes on the web through NOVASIS. That's it! Any questions? Ask your advisor!

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## **B.S. in Mathematics/M.S. in Applied Statistics Program**

This program will allow a Villanova student to earn a bachelor's degree in Mathematics and a Master's degree in Applied Statistics in five years. Students in the Five-Year Program will benefit from exposure to concentrated statistics content, including graduate course work, within the time normally allotted to an undergraduate program. Students will be rewarded for their focus on statistics and on graduate course work by earning a BS in Mathematics and an MS in Applied Statistics in the equivalent of five years instead of six.

Students in the Five-Year BS/MS Program will complete all of the required work for a BS in Mathematics, including the core curriculum and all free electives. They will also complete all of the requirements for an MS in Applied Statistics. For the typical students, the accelerated timeframe for the two degrees depends upon three specific courses that are cross-listed as both undergraduate and graduate. Because of the relatively strong Mathematics and Statistics backgrounds of Villanova undergraduate Mathematics students, those students who choose to continue on to the MS in Applied Statistics program will not be required to retake these same basic courses at the graduate level.

Students may apply to be admitted to the Five-Year BS in Mathematics/MS in Applied Statistics Program after they have earned enough Villanova credits to achieve Junior status and after having completed MAT 4310 Statistics Methods or the graduate level version MAT 7404 Statistical Methods I. Students applying to the Five-Year BS/MS Program must have a cumulative overall grade point average (GPA) of 3.3 or higher and must also have a cumulative grade point average of at least 3.5 in all mathematics courses they have taken at Villanova.

For more information regarding the Five-Year BS in Mathematics/MS in Applied Statistics Program, please contact Dr. Levitan at [michael.levitan@villanova.edu](mailto:michael.levitan@villanova.edu) or 519-4818.

## **B.S. In Mathematics/M.A. In Mathematics 5-Year Program**

This program will allow students to earn both a Bachelor of Science degree and a Master of Arts degree in Mathematics in only five years. Students in this program will complete all the core curriculum and free elective courses required for a B.S. in Mathematics. Students are able to earn both degrees in this shortened time frame due to the fact that there are three specific courses that are cross-listed as both undergraduate and graduate courses. Villanova students may apply for the program after completing MAT 3500 and after they have earned at least 24 credits in Mathematics. It is required that all students have a cumulative overall grade point average of at least 3.3 and a grade point average of 3.3 or higher in all required mathematics courses they have taken at Villanova.

Students in this 5 year program can apply to receive their B.S. diplomas after completing all the undergraduate requirements. Once students complete the requirements for the 5 year program they will receive their M.A. in Mathematics.

For more information regarding the 5 year B.S./M.A. in Mathematics program please contact Dr. Sprows at [david.sprows@villanova.edu](mailto:david.sprows@villanova.edu) or 519-7339.



# Math Electives For Spring 2005

- **MAT 4270** – *Numerical Analysis*

Numerical analysis is the study of computing approximations to mathematical problems. We study methods to approximate the roots of equations, derivatives, integrals, differential equations, and systems of equations to name a few. The methods often involve producing a sequence of approximations so questions of whether the sequence converges and how fast it converges are studied. This course will count as a math major's second analysis requirement. The software Maple will be used to help make our approximations, though students may use other software if desired.

- **MAT 4310** – *Statistical Methods*

This course is an introduction to data summarization and various statistical methods that will allow the 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 5900** – *Seminar in Unsolved Problems in Number Theory*

In the first three weeks of this course students will gain an overview of the textbook, focusing on the general themes and notations of each section in his book. By the end of this time, students will each choose a problem to investigate this semester. In the next four weeks, students will investigate their problem, mostly numerically or graphically but hopefully with some theoretical thinking. Starting near midterms, students will begin reading papers on their topic, and focus more on the theoretical aspects of their problem. The math department has instituted this seminar to provide students with intensive training in oral and written presentation skills, hence the course concludes with a half hour oral presentation of your problem, plus a 10-12 page written report. There will be four drafts of the written report, and four preliminary oral presentations, hence your final presentation and report will be well polished.

- **MAT 5920** – *Computational Molecular Biology*

Computational Molecular Biology is a writing-enriched interdisciplinary honors course open to sophomores, juniors, and seniors majoring in the sciences. There are no specific prerequisites; however, an interest in the subject and a willingness to work with others in solving open-ended problems are essential. The objectives are for students to learn to identify and recognize problems of molecular biological significance amenable to computational or mathematical modeling or solutions; investigate or design algorithms for solving these problems, evaluating their efficiency and complexity; and develop communication techniques for working with investigators with backgrounds in other disciplines. A problem-based learning approach will be employed in which teams, formed of students from different majors, will address problems posed by the instructors. Topics to be considered include restriction mapping, permutations of genes, sequence alignment, gene prediction, gene translation, and site identifications. During class, instructors will present the problems and background information, and teams will report on progress and interact with other teams.

- **MAT 5930** – *Introduction to Permutation Groups and their Combinational Applications*

Groups measure symmetry. Generally speaking, this means that the best way to study symmetries of a combinatorial object (e.g., graph, geometry, code, design) is through analysis of its automorphism group. In this course we define the important, though elementary, notions of permutation group and group action. We soon discover that each group has its own "structural DNA," which at once reveals all that can be said about how it acts on extraneous objects. Topics in this course include induced actions, transitivity, primitivity, orbits, stabilizers, fixed points, Felix Klein's Vision of Geometry, Orbit-Stabilizer Theorem, Cauchy-Frobenius-Burnside Theorem, and Polya Theory. This course will be application-driven, however all applications lie in the realm of pure mathematics (i.e., this is NOT an applied mathematics course). Prerequisites for this course include MAT 3400 and MAT 3500.

- **MAT 5930** – *Logic*

Logic is the study of the laws of truth and the fundamental principles of correct reasoning. As such, it forms the very basics of mathematics. Logic is highly relevant to a wide range of other disciplines, most notably the computer sciences (artificial intelligence, computability theory, etc.) and philosophy. For this reason, this course could be equally interesting for mathematics, computer science, and philosophy students, or anyone with mathematical and theoretical inclinations. This course is meant to be an introductory course to the exciting subject of logic, and will be fully self-contained (no formal or informal prerequisites necessary).

### Have You Been to the MLRC Lately?

The Mathematics Learning and Resource Center (MLRC) is a great place to go for a tutor, study, meet as a group, get access to mathematical computing resources, or just kick back and relax! Is there anything that you can't do at the MLRC?! I don't think so! Walk-in tutorial services are available in the afternoon and evening. The MLRC has a computer lab featuring 13 workstations, all equipped with Villanova mathematics course software, such as Maple, Minitab, SAS, and Excel. Don't forget to check out the Math Lounge for quiet study or relaxation!

### MLRC and Math Lounge

**Where:** Old Falvey, 2<sup>nd</sup> Floor  
(next to the Writing Center)

**Hours:** Monday–Thursday 1-5PM & 6:30-9PM  
Sunday 6:30-9PM

**Phone:** 519-MLRC

**Voicemail:** 519-5193

**Web Address:** [www.villanova.edu/mlrc](http://www.villanova.edu/mlrc)

**Contact:** Melissa Simone at 519-7823

### Congratulations to the New Officers of the Math Club!

President – Stephanie Kersting  
Vice President – Daniel Mulhern  
Treasurer – Kristopher May  
Secretary – Amy Tam

### Fall Semester Dates to Remember

October 21	Advising begins for Spring 2006
October 21-23	Homecoming Weekend
November 2	Registration begins for Spring 2006
November 9	Last Day for authorized withdrawal without academic penalty (WX)
November 22	Thanksgiving begins after last class
November 28	Classes resume
December 12	Final day of classes
December 13	Reading Day
December 14-20	Final Exams

### Study Abroad

Interested in studying abroad? Stop by Villanova's Office of International Studies and meet with a member of the staff to learn about different opportunities. The International Studies Office is located in Middleton Hall and is open from 9AM to 5PM, Monday through Friday. You can contact them by telephone at (610)519-6412. For more info, visit the International Studies website at:

<http://www.internationalstudies.villanova.edu/>

