



# The Sum Times

October 2015

## Message from Dr. Norton

If a "welcome back" column for a semester that began in August can be relegated to October, then surely the content of the message can be delegated to appropriation and modification. So here is a merger of three translations of "Prayer Before Study" by St. Thomas Aquinas and "A Teacher's Prayer" by Marsha Elyn Wright.



Dr. Douglas Norton  
Dept. of Mathematics and  
Statistics Chairperson

Divine Creator, true source of light and font of wisdom,  
Graciously pour forth a ray of your brilliance  
Into the darkened places of my mind.  
Dissipate the double darkness that covers me,  
An obscurity of sin and ignorance.

Grant to me a penetrating mind to grasp,  
Capacity to remember, skill in learning,  
Lucidity to understand, subtlety to interpret,  
And abundant grace to express myself  
With thoroughness and charm.

Guide the beginning of my work,  
Direct its progress,  
And bring it to successful completion.

Help me to be grateful and challenged,  
Committed, inspired, and patient,  
Gentle, wise, and unwavering.  
Keep me calm in the midst of turmoil,  
Faithful in the days of discouragement,  
And dedicated to bringing to a fellow traveler  
A smile.

*"Mathematics  
consists of  
proving the  
most obvious  
thing in the  
least obvious  
way." --  
George Polye*

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**"One cool thing  
about  
mathematics is  
they don't have  
to be able to  
understand math  
to see the passion  
that makes it so  
exciting to  
them."  
— Paul Pierce**



Request to follow us on twitter! Our twitter name is VUMathStat.

Join the Math Department's page on **LinkedIn** to connect with alumni and students and faculty. This is a great way to find out about internships and to form a network!



Become a fan of the **Department of Mathematics and Statistics at Villanova University** page on **Facebook**.

## Math Club

The Math Club at Villanova welcomes everyone from all schools and majors. The club has events throughout the entire year such as quizzo, career night, study parties, and movie nights. We host bake sales each semester to raise money for the Starfish Foundation, a non-profit organization founded by Villanova Math Major Alums, which provides scholarships and mentoring to youth living in extreme poverty in Ecuador. This year we will be hosting new events to increase faculty involvement, including "Teacher TED Talks" and Lunch with the Faculty. Through the Math Club, we hope to help students learn what the Math Department has to offer, while being an active member of the Villanova community.

### Math Club Officers

**President:** Danielle Riverso  
driverso@villanova.edu  
**Vice President:** Karolina Golabek  
kgolabek@villanova.edu  
**Treasurer:** Anna Lake  
alake@villanova.edu  
**Secretary:** Carolina Staub  
cstaub1@villanova.edu

Join the [Villanova Math Club](#) page on Facebook for more information and updates!

### Math Club Dates

**Oct 5** — Midterm Study Rooms (week long)  
**Oct 6** — Meeting MLRC 5:30PM  
**Oct 30** — Halloween Bake Sale 11-2PM  
**Nov 3** — Meeting MLRC 5:30PM  
**Nov 7-8** — SPO Weekend Booth  
**Nov 17** — Teacher TED Talks 5:30 PM  
**Dec 7** — Finals Study Rooms (week long)

Check your email and the board outside the Mathematics and Statistic Department for updates!

## Mathematics Learning And Resource Center (MLRC)

**Location:** 211 Falvey Library

**Phone:** 610-519-MLRC (6572)

**Dates:** September 3– October 9  
October 20–November 24  
December 1– December 11

**Hours:** Sunday 6:30–9:00pm  
Mon.–Thurs. 1:00–5:00pm  
& 6:30–9:00pm

Check out our web page at [www.villanova.edu/mlrc](http://www.villanova.edu/mlrc) for more MLRC info regarding Villanova math course, tutoring schedules, math links, and MLRC email.

If you think dogs can't count, try putting three dog biscuits in your pocket and then giving Fido only two of them.

~Phil Pastoret



## Department of Mathematics & Statistics

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## Spring 2016 MAT Electives

### **MAT 4310 — Stats Methods**

(Dr. Yimin Zhang, Dr. Joe 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 foundation 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. Prereq: MAT1505

### **MAT 4315 — Stats Modeling** (Dr. Paul Lupinacci)

Simple and multiple linear regression, including prediction, correlation, model building, multicollinearity, influential observations, and model fit; ANOVA for designed experiments, including completely randomized, randomized block and factorial designs; Time Series including linear time series models, moving averages, autoregressive and ARIMA models, estimation and forecasting. Prereq: MAT4310

### **MAT 4550 — Financial Derivatives** (Dr. Klaus Volpert)

Financial derivatives have become an indispensable part in today's economy. Examples are stock options, oil futures, currency contracts, credit default swaps and much more. They are used for compensation, speculation, and, most importantly, for risk management. Since every company is exposed to some risk, there are few companies that do not deal with derivatives in some way. Hedge Funds often play the counterpart to the companies by investing in these derivatives and thereby redistributing market risks.

Financial derivatives are not uncontroversial. While former Federal Reserve chairman Alan Greenspan has called them engines of the economy, billionaire investor Warren Buffet has famously declared them weapons of mass destruction.

The challenge to the mathematician is to find a fair price for derivative contracts. In 1973, a mathematician, Fischer Black, and an economist, Myron Scholes, developed a successful model that has become the foundation for the whole theory and won them the Nobel prize in economics in 1997. Our goal is to understand this model, as well its extensions and refinements. Prereq: MAT2705



### **MAT 5400 — Complex Analysis** (Dr. Paul Pasles)

Why "get real" when you can get complex? The results of algebra, calculus and geometry are all the more beautiful when viewed through a complex lens. In this course we'll study functions of a complex variable. We will cover Cauchy's theorem, power series, Laurent series, and much more. The official prerequisites for this course are MAT 2500 (Calc III) and 2600 (Foundations). Prereq: MAT2500 & 2600

*"I'm sorry to say that the subject I most disliked was mathematics. I have thought about it. I think the reason was that mathematics leaves no room for argument. If you made a mistake, that was all there was to it."*  
— Malcolm X

### **MAT 5500 — Topology** (Dr. Dave Sprows)

Topology studies the "essential" shape of geometric figures. For example a circle has essentially the same shape as a triangle, but the figure eight is not "essentially the same" as the circle (there is a point on the figure eight which when removed leaves two disjoint pieces, no such point exists on the circle). This course will consider such topics as the classification of surfaces and aspects of embedding theory, i.e., the various ways one geometric figure can be placed inside another geometric figure. It will be designed to give some of the flavor of one of the most important areas of mathematics. As stated by the renowned mathematician Jean Dieudonne, "It may already be predicted without great likelihood of error that the 20th century will come to be known in the history of mathematics as the century of topology." (A Panorama of Pure Mathematics, 1982 ). CoReq: MAT3300

### **MAT 5700 — Math Stats I** (Dr. Elise Pasles)

Topics covered in MAT 5700 include probability, random variables, joint distributions, expected values, covariance, correlation, the moment generating function, Chebyshev's inequality, and important families of random variables. Students who are interested either in statistics or in actuarial science should strongly consider taking this course. There is a substantial overlap between the course syllabus and the syllabus for the first actuarial exam. Prereq: MAT2500 & 2705

### **MAT 5705 — Math Stats II** (Dr. Jesse Frey)

This is a course on the theory of statistical inference. Key topics include the law of large numbers, the Central Limit Theorem, point estimation, maximum likelihood estimation, consistency, sufficiency, interval estimation, sampling distributions, hypothesis testing, order statistics, and Bayesian statistics. This course should be of interest for any student who wants to do a graduate degree in statistics or who wishes to understand the theoretical foundation for the standard methods of applied statistics. Prereq: MAT5700





What did one  
math book say to  
the other?

Don't bother me.  
I've got my own  
problems!



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### **MAT 5920-001— Topics: Epidemiology** (Dr. William Fleischmann)

This class will explore the very rich interplay between the ideas of mathematical modeling and the study of disease epidemics. We will also connect the study with the role of disease in the history of civilizations. Topics include dynamics of epidemics, the importance of social, cultural, and infrastructural factors in the spread of disease, mathematical models including recent work on models of the 2014 Ebola outbreak in West Africa, threshold effects, equilibrium and stability, and a selection of concepts and topics from traditional epidemiology. Mathematical prerequisites: an understanding of the derivative, familiarity with differential equations, and algebra. Biological prerequisites: not much except a certain resilience and fearlessness about reading and making some sense of non-technical material in a new discipline.

## Spring 2016 MAT Seminars

### **MAT 5900-003 — Operations Research**

(Dr. Bruce Pollack-Johnson)

Students will have a chance to develop a project in an area of Operations Research, either Deterministic (non-probabilistic) or Stochastic (probabilistic). Topics can include, but are not limited to: linear programming, integer programming, the Assignment Problem (such as assigning graders to math courses), the Shortest Path Problem (what Google Maps does), Game Theory, project scheduling, nonlinear programming, the Traveling Salesperson Problem, heuristic algorithms, Queuing Theory, the News Vendor Problem, Inventory Theory problems, and many others. Students will research the math behind the algorithms used to solve their problem, as well as solving a real-life problem from their own life or experience. Prereq: MAT3300 or 3500

### **MAT 5900-001 and 002 — Hadamard Matrices**

(Dr. Osvaldo Marrero)

These are three easy-to-understand notions that coexist in certain cases. The students will have the opportunity to choose and study some aspects of these topics. In general, our subject is considered part of constructive combinatorics. We'll be mainly interested in the mathematical, theoretical viewpoint. However, all three topics have a variety of applications. For example, Hadamard matrices can be used to create codes; combinatorial designs are used in the design of experiments in statistics; and difference sets have found application in radar design. Mathematically, Hadamard matrices are, as the name obviously implies, matrices; the principal problems are the existence and construction of these matrices. A simple way to understand a combinatorial design is as a binary matrix that must satisfy certain conditions. And a difference set is a group subset that obeys certain requirements. The prerequisites are MAT 3400 and MAT 3500; students must have successfully completed the two prerequisite courses before enrolling in this seminar. Prereq: MAT3300 or 3500

## Fall Semester Dates to Remember:

- Oct 9 (F)** — Mid-term
- Oct 12 (M)** — Semester Recess
- Oct 19 (M)** — Classes Resume
- Oct 21 (W)** — Grades Due (Noon)
- Oct 23 (F)** — Registration Advising Begins
- Nov 11 (W)** — Last Day for Authorized Withdrawal without Academic Penalty (WX)
- Nov. 13 - 15 (Fri - Sun)** — Homecoming
- Nov 24 (T)** — Thanksgiving Recess begins after last class
- Nov 30 (M)** — Classes Resume
- Dec 8 (Tu)** — Deemed a Friday Class Day and will follow a Friday Schedule for UG Day only
- Dec 10 (Th)** — Final Day of Classes
- Dec 11 (F)** — Reading Day
- Dec 12-18 (Sat - Fri)** — Final Examinations (No exams on Sun. Dec. 13)
- Dec 21 (M)** — Final Grades Due (12 Noon)

## 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.

Office of Education Abroad  
Middleton Hall, 2nd Floor  
(610)519-6412  
abroad@villanova.edu

For more information, visit their website at:  
[www.internationalstudies.villanova.edu](http://www.internationalstudies.villanova.edu)

If you would like to submit an article or have an idea for the SUM Times, please contact Ellie Inzitari at [einzitar@villanova.edu](mailto:einzitar@villanova.edu)



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Registration



## To All Students: Set up an appointment to meet with your advisor to prepare for registration.

### Preparing for Registration

#### Meet with your Academic Advisor:

- Discuss your course options for next semester
- Receive your Registration PIN (a.k.a. Alternate PIN)

#### Registration PIN:

- Save it to your phone or email
- Changes each semester
  - Spring Registration PINs begin: sp \_\_\_\_\_ (four random numbers)
  - Fall Registration PINs begin: fa \_\_\_\_\_ (four random numbers)
- Take the time to test your PIN before your registration time begins

**How to "Test" your PIN:** Go to your *Student* tab → *My Schedule and Registration* → *Login to Register* –> Select the appropriate term → type your PIN

- If you enter the correct PIN, the system display your registration time appointment
- If you enter an incorrect PIN, you will receive an error message: *Authorization Failure – Invalid Alternate PIN*

If you feel you have the incorrect PIN, contact your Advisor or your Advising Center

**Note:** The system is "case sensitive." The letters are lower case.

#### Check your Registration Status

- link will display the following:
  - Date and time you can begin registering and the date and time online registration ends.
  - An alert if you have Holds on your account which will prevent registration
  - Link to *View Holds* is at the bottom of the screen
  - Your Academic Standing
  - Your Student Status
  - Your Class for registration (example: *Sophomore* class will not permit registration into courses restricted to Juniors and Seniors only)

#### Holds that prevent registration:

- (Holds most often seen – not a complete list)
  - Acad Integ Pledge – VPAA – student has not completed the Pledge
  - No Med Form – Call Health Center
  - No Social Security # on file – Bursar's Office needs this to complete tax forms for students
  - Bursar Registration Hold – student has a balance owing
  - Must Call Dean of Students
  - Financial Aid Hold – Call FinAID

**Note:** Hold can only be removed by the originating office

**Search for Classes:** The *Master Schedule Class Search* will allow you to search the semester's course offerings using various criteria. You can be as vague or as detailed in your search as you want. For example, you can search by just selecting an Attribute Type like Diversity Requirement 2.

When planning your schedule, be flexible and make notes of your options. Some sections may be filled and you will need to select a different time or teacher or course.