Message from Dr. Norton

A Brief March through some History in March, with Questionable Life Lessons

March 1, 1872, President Ulysses S. Grant signed the Yellowstone National Park Protection Act into law. The world’s first national park was born. Be the first to do something. Protect something precious.

On March 2, 1962, in Hershey, Pennsylvania, right up the street from the chocolate factory, Wilt Chamberlain scored 100 points in a game against the New York Knickerbockers. The game was not televised, no New York sportswriters showed up, and a 14-year old local boy ran onto the court when Chamberlain scored his 100th point, shook his hand, and then ran off with the basketball. Do something amazing without worrying who is there to see it. Collect the occasional souvenir. Plus, almost anything is possible in the neighborhood of chocolate.

The Iditarod begins on the first Saturday in March every year. It is an Alaska dogsled race of roughly 1000 miles across jagged mountain ranges, frozen river, dense forest, desolate tundra, and miles of windswept coast, with temperatures far below zero, winds that can cause a complete loss of visibility, and hours of darkness. Take on challenges, even if the terrain seems imposing and you seem to be working with dogs. Sounds like a math course? Or life?

On March 13, 1781, the planet Uranus was accidentally discovered by British astronomer William Herschel while looking for something else. It was the first new planet discovered since ancient times. Astronomers later learned they had observed Uranus as far back as 1690; they had just never really noticed it for what it was. Keep searching and discovering. You never know what you will find, even in plain sight. Plus, be careful in choosing names and how to pronounce them.

On March 18, 1965, Soviet cosmonaut Aleksei Leonov made the first space walk during the Voskhod II mission. He performed this above Siberia. Take walks. Visit exotic places. Soar.

Hiding amidst the busy week of Pi Day, the Ides of March, and St. Patrick’s Day is the feast day of St. Julian of Antioch on March 16. Before his death around A.D. 305, he was sewn into a sack filled with vipers and scorpions and hurled into the sea. Okay, celebrate irrationality on Pi Day, beware of assassins on the Ides of March, and practice sustainability (green?) on St. Paddy’s Day, and we’ll just skip that St. Julian thing. Sprinkle in some springtime and March Madness, and have a good remainder of the semester.
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

Co-Presidents: Elizabeth Leonard
eleonar5@villanova.edu
Ron Berna
rberna@villanova.edu
Treasurer: Saurabh Verma
sverma@villanova.edu
Social Chair: Meghan Carlock
mcarlock@villanova.edu

Join the Villanova Math Club page on Facebook for more information and updates!

Math Club Dates

3/14: Pie Day Bake Sale in Connelly! Enjoy sweet treats to celebrate a math fanatic's favorite holiday.

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

Mathematics Learning And Resource Center

Location: 204 Falvey Library

Dates: January 22 — March 1
March 12 — March 27
April 3 — May 3

Hours: Sunday 6:30-9:00pm
Mon.-Thurs. 11:00-5:00pm & 6:30-9:00pm

Phone: 610-519-MLRC (6572)

Check out our web page at www.villanova.edu/mlrc for more MLRC info regarding Villanova math course, tutoring schedules, math links, and MLRC email.
Fall 2018 MAT Electives

MAT 4310 — Stats Methods (Dr. Elise Pasles, Dr. Yimin Zhang)
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. Prerequisite: MAT1505

MAT 4550 — Mathematics of Financial Derivatives (Dr. Klaus Volpert)
This course covers topics from Financial Mathematics, such as:

- Mortgages and Loans
- Inflation and other Interest rates
- What are Stocks? Bonds? Options?
- A Random Walk on Wall Street
- Volatility of stocks
- The concept of Arbitrage
- Put-Call Parity;
- The Black-Scholes Model for Option Pricing
- Monte Carlo Methods for Option Pricing

The course is also helpful in preparation for actuary exams FM and MFE.

MAT 5110 - Topics in Geometry (Dr. Robert Styer)
Euclidean geometry, non-Euclidean geometry, projective geometry, analytic geometry, differential geometry, finite geometry, solid geometry, affine geometry, tropical geometry, spherical geometry, hyperbolic geometry: how can there be so many kinds of geometries? We will begin with an overview of the classical Euclidean geometry and its influence on modern mathematics, then how a crisis emerged which led to new conceptions of physical space and mathematical reality, leading to the plethora of different geometries we use today.

MAT 5700 - Math Stats I (Dr. Yimin Zhang) (This counts as the second analysis)
The course covers the basic principles of the theory of probability and statistics. Topics include: probability, random variables, discrete and continuous probability distributions, important families of distributions, multivariate probability distributions, and functions of random variables. Prerequisites: MAT2500 & 2705
“I find all of my performances come down to mathematics in a sense — how do you approach the problem of this character? Sometimes I crack that problem, sometimes I don’t.” - Brad Pitt

MAT 5500 - Topology (Dr. Timothy Feeman)
The word Topology means, literally, the study of location or position. Mathematically, the subject of topology explores the concept of continuous mappings and studies geometric features that are invariant under continuous transformations. This leads to such statements as, “A topologist can’t tell the difference between a coffee cup and a doughnut.” From its beginnings in the first part of the twentieth century, topology has become a common language that pervades many areas of mathematical inquiry. In the twenty-first century, new applications of topology have emerged in areas as diverse as genomics, robotics, neuroscience, economics, and geographic information systems. In our course, we will start with the classical study of topological spaces and continuity, dip into some theory of invariance, and at least get a glimpse of some modern applications of topology.

MAT 5900 Seminar: (Alexander Diaz-Lopez)
In this seminar, we will discuss topics two main topics: the mathematics behind several games (such as Sudoku, SET, Rubik’s Cube, and Bingo) and permutations. Students will develop a project, final presentation, and final report. Depending on the chosen project, students may find themselves learning and discussing topics in combinatorics, abstract algebra, algebraic combinatorics, and statistics. Some of the projects will involve the use of the mathematics software SAGE (or any other equivalent software such as Mathematica, Maple, etc).

MAT 5920-001 TOP: Partial Differential Equations (Dr. Kaitlyn Muller)
This course serves as an introduction to applied mathematics and as a continuation of the sequence of calculus, differential equations, and linear algebra. We will introduce the three main types of partial differential equations: parabolic, elliptic, and hyperbolic. The canonical PDEs of each type are the heat equation, Laplace’s equation, and the wave equation. We will include mathematical tools, real-world examples, and applications. In particular we will discuss first order PDEs and their derivation, the canonical second-order linear PDEs, initial value and boundary value problems, and solution techniques (i.e. method of characteristics, separation of variables, traveling waves, integral transforms, Green’s functions, etc.). We will discuss applications to biology, economics, chemistry, and engineering. The goal of this course is to demonstrate that PDEs are powerful tools for modeling real-world phenomena, develop understanding of the behavior of basic PDEs, and learning the solution strategies for particular solvable PDEs. We also aim to build an intuition for understanding more complicated PDEs.
Prerequisites: Mat 1500, 1505, 2500, 2705

Don't forget to make an appointment with your advisor prior to your registration date/time. All advisors have their office hours posted at their office.
MAT 5920-002 Data Science (using R) (Dr. Michael Posner)
Data-savvy professionals are in high demand in businesses, public agencies, and nonprofits. The supply of professionals who can work effectively with data at scale is limited, and is reflected by rapidly rising demand and salaries for data scientists, currently rated the #1 job in the US in 2016. This course explores how real-world data from a variety of disciplines are gathered, managed, and used for making decisions or predictions. Core Topics will include data wrangling, visualization, multivariable thinking, text processing, data mining, ethics, and simulation-based inference. This course will introduce students to the statistical programming language R to accomplish these tasks. Prerequisite: any introductory statistics course (MAT1230, MAT1250, MAT1430, MAT4310, MAT1313, or similar).

MAT 5920-003 TOP: Design of Experiments (Dr. Paul Lupinacci)
This course provides an introduction to the design and analysis of statistical experiments. Experimental design techniques are used in a wide variety of academic, industrial, and scientific areas. We will cover widely used designs, including but not limited to: Completely Randomized Designs, Randomized Block and Latin Square Designs, full and fractional factorial designs, nested and split-plot designs, and response surface methodologies. We will discuss practical and computational issues regarding their design and analysis. This course fulfills a math elective or an elective for the statistical minor.
Pre-requisite: MAT 4310

Save the Date!

Pi Mu Epsilon Induction
Monday May 4th 2018
10:20am - 12:00pm

Guest speaker: Dr. Betty Mayfield
(more information to follow via email)
Spring Semester Dates to Remember:

March 2 (Fri) — Spring Break Recess Begins after last class
March 12 (M) — Classes Resume
March 28 (W) — Easter Recess Begins after last class
March 3 (Tu) — Classes Resume
April 4 (W) — Last Day for Authorized Withdrawal Without Academic Penalty (WX)
May 1 (Tu) — Deemed a Friday Class Day and follows a Friday schedule for UG Day only
May 2 (W) — Deemed a Monday Class Day and follows a Monday schedule for UG Day only
May 3 (Th) — Final Day of Classes
May 4 (Fri) — Reading Day
May 5-11 (Sat - F) — Final Examinations (No exams on Sun. May 1)
May 14 (M) — Final Grades Due - (12 Noon)
May 18-19 (Fri - Sat) — Baccalaureate and Commencement
June 29 (Fri) — Last day for submission of work to remove incomplete

Math Discovery Boot Camp

This coming May, eight students will be part of our inaugural Math Discovery Bootcamp. The goal of the program is to introduce participants to intriguing problems in math/stats that could potentially lead to a senior-year research project or a mathematics seminar presentation. The Mathematics Discovery Bootcamp will also provide graduate school information and advice, along with mathematics career perspectives that demonstrate the value of advanced study in math. If this is of interest to you, keep the program in mind for future years.

For additional information, contact Dr. Diaz-Lopez, Dr. Haymaker or Dr. Corwin.
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.