

UNDERGRADUATE MATH SEMINAR

In this week's math seminar, you will have the opportunity to hear about a profession that is well suited for math majors, that of being an actuary.

DATE: **Thursday, May 6**

Time: **1:20 – 2:15**

Zoom: <https://union.zoom.us/j/92591304428>

In this week's seminar, **Union College alumna, Mary Annese '05**, ACAS, CPCU, MAAA, will present the following talk:



Mary Annese, '05

Title: An Introduction to the Actuarial Profession

Abstract: This seminar will provide an introduction to a promising career in what has been touted as one of the nation's top ranked professions because of its employability, career growth, high-paying salaries, and work-life balance. You will learn: what an actuary is; what actuaries do; how to become an actuary; what the Casualty Actuarial Society (CAS) is; why this is an attractive career; your next steps!

For more information about the CAS, you can go to CASstudentcentral.org and register to become a student member. It is *free* and provides you with access to a wealth of tips, tools, and resources.

Senior Writing and Pieces from Thesis

Cara LaPorta participated in the Senior Writing Seminar with Professor Kim Plofker.

This past winter term, I had the opportunity to enroll in the Senior Mathematics Writing Seminar taught by Professor Plofker. Entering this course, I can wholeheartedly say I was intimidated by the idea of writing a thesis paper, as I had heard numerous upperclassmen complain about the dreaded requirements that each paper had. I had just finished the course Real Analysis in the fall, and at that point I was extremely discouraged from an academic standpoint due to the level of difficulty that this course presented. With that being said, through Professor Plofker's support throughout the duration of my thesis, I can confidently say that my writing seminar course helped me find my passion for mathematics, once again.

Since I enrolled in the writing seminar (opposed to an independent thesis), I was required to write two separate papers pertaining to the history of mathematics. My first paper was on Peter Gustav Lejeune Dirichlet's contribution to the evolution of a function. This paper, which was about 8 pages long, discussed Dirichlet's work relating to the continuity and convergence of functions, as well as depicted his process of deriving the Dirichlet Function (which is basically a piecewise function). Secondly, my main thesis paper was on Leonhard Euler's derivation of the \tan^{-1} series, in which he applied to calculate an accurate value of π . This paper, which finished to be about 15 pages long, analyzed prior work done by Archimedes of Syracuse, as well as advancements made by Gottfried Wilhelm Leibniz. However, my work primarily focused on Euler's derivation of his own arctan series, which was not only more mathematically accurate than his predecessors, but more time efficient, as well (it required MUCH less work). I then discussed how Euler utilized his new series to calculate π to approximately 20 decimal places and how his overall finding contributed to mathematics, as a whole.

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My best advice for those who are writing a math thesis and/or taking the writing seminar is to first pick a topic that interests you and/or applies to whatever you want to pursue in the future. Secondly, make sure you budget your time well! I can't emphasize enough how long I spent looking on various websites or academic journals to find needed information. I think it got to a point where I was spending more time looking for research than I actually was writing my thesis paper. Lastly, make sure you have fun with it! You have absolutely no reason to be intimidated by the idea of a math thesis, as the mathematics department faculty are more than willing to guide you through the writing process. From my experience, as long as you stay motivated and reach out for help when needed, you should have no issues with completing your paper. With that being said, I wish you all the best luck and I hope you have as much of an enjoyable experience as I did during the writing process.

Fall Term Preregistration: Petitioning Begins Saturday, May 8

As we are entering Week 6, it is time to start planning your fall term course schedule. The petitioning process starts on Saturday, May 8 and runs through Tuesday, May 11. *Petitioning for math courses will still be handled via WebAdvising this term.*

For the fall, **only the following math courses are petition courses: Math 105, 110, 113, and 115H**

Courses beyond calculus: This fall, the Math Department will be offering several interesting courses beyond the calculus sequences that are suitable for math majors and minors.

- **Math 127 – Numerical Methods.** Some mathematics is best handled via numerical approximations. How is this done? How effective are some of the common methods? In this course, students will study numerical differentiation and integration, numerical methods to solve differential equations, and appropriate error methods. This course is wonderful for students interested in both math and/or computer science, or anyone with an interest in applied modeling problems! Prerequisites for this course are Math 115 and fluency in some mathematical programming language.
- **Math 140 – Applied Linear Algebra.** This course is an introduction to linear algebra that emphasizes applications, such as least-squares fitting, linear programming, image compression, Markov chains and discrete dynamical systems, computer graphics, principal component analysis, the Google PageRank algorithm, and others. The prerequisite for this course is Math 115. *This course is not intended for math majors who are instead required to take Math 340 (Linear Algebra); credit for both Math 140 and 340 is not normally granted. Exceptions require approval of a proposal from the student to the department chair.*
- **Math 199** is the department's "bridge course," intended to help students make the transition from computationally oriented courses to more theoretical proof-writing courses. This is a **required** course for all math majors and minors that is *usually* taken after Math 115.
- **Math 219 – Discrete Mathematics.** In this course, topics studied may include graph theory, partially ordered sets, the Four-Color Theorem, and more. As a 200-level course, Math 219 is appropriate for students coming from Math 199, as well as more advanced students.
- **Math 221 – Mathematical Cryptology.** This course will provide an in-depth look at the mathematical theory underlying modern methods to accomplish the secret transmission of data. This is another good choice for students coming from Math 199, as well as more advanced students. Note that students generally may not take both Math 221 and Math 235 (Number Theory) – choose wisely!
- **Math 336 – Real Variable Theory.** is a core course that is **required** for math majors. In this course, you will learn some of the theoretical underpinnings of the calculus of functions whose domain lies within the set of *real* numbers.

For a complete listing of fall course offerings: <https://www.union.edu/registrar/2021-2022-course-and-exam-schedules>.