

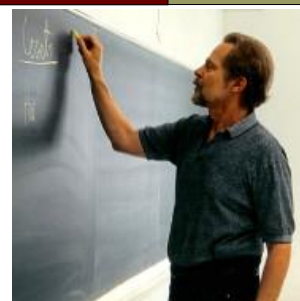
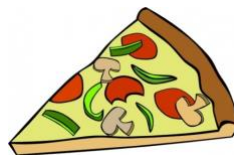
UNDERGRADUATE MATH SEMINAR

The next math seminar on the term will be

DATE: **THURSDAY, September 18**

Time & **12:30 – Refreshments in Bailey 204**

Location: **12:50 – 1:45 Seminar in Bailey 207**



Professor Kimmo
Rosenthal

In this seminar, Union College **Professor of Mathematics (Emeritus), Kimmo Rosenthal** will present the following talk.

Title: Abstraction: From Set Theory to Category Theory

The imagination is the only genius. It is intrepid and eager and the extreme of its achievement lies in abstraction.

Abstract: As Math 199 begins to unfold many students feel as if they have been dropped into hostile territory without any hope of reinforcements. Why does abstraction make many people uncomfortable, in fact in some quarters provoking outright hostility? Is there still a place for purely abstract mathematics to be viewed simply as an aesthetic intellectual endeavor, one that valorizes the human spirit.

We will take a brief historical tour of the rise of abstraction from the set theory and study of infinity of Georg Cantor (called a “corrupter of youth”) to the emergence of point-set topology, followed by the appearance of Bourbaki (the mysterious mathematician who never existed), and finally the burgeoning in the 1960’s of category theory, which earned the epithet of “abstract nonsense”. There will follow a gentle introduction to category theory accessible to anyone having taken (or perhaps taking) Math 199, including consideration of the question: can we talk about properties of sets without explicitly mentioning their elements, using only the language of functions?

Bio: Professor Rosenthal retired from Union College in 2020 after many, many years at the college. He spent nearly a decade of that time as the Dean of Studies and also regularly taught the First-Year Seminar. He has over 30 publications in category theory including two books, and he also has over 40 literary publications.

What Do Math Faculty Do in the Summer? Some Highlights

- **Professor Sean Carney**, an applied mathematician, spent most of his summer conducting research, touring upstate NY, and playing basketball with other faculty and staff. He published a preprint and continued his work on stochastic optimization problems. Spending a weekend in nature near Union Falls pond (see picture) in the Adirondacks was a highlight.
- **Professor Rylan Gajek-Leonard**, a number theorist, travelled to Montréal, Québec, to attend a conference on arithmetic cycles, modular forms, and L-functions.
- **Professor Roger Hoerl**, a statistician, gave the keynote address at the Quality and Productivity Research Conference, sponsored by the American Statistical Association and the American Society for Quality, held at the University of Washington in Seattle, June 16-17. Professor Hoerl's presentation was entitled "The Future of Statistics in an AI Era." The written version of the presentation has subsequently been accepted for publication in the journal Quality Engineering.



From Prof. Carney: Union Falls pond

Students – Join the MAA. It Is Now FREE for you!

Through the Union College Math Department's institutional membership, students are now able to become members of the Mathematical Association of America (MAA) for free! Student members receive online subscriptions to **all** MAA Journals, including The American Mathematical Monthly. Additionally, they have access to exclusive professional development resources, community networking opportunities, and more. As their website says, "MAA membership is your portal to the community of mathematicians and mathematical educators all focused on advancing mathematics at the collegiate level and providing you with opportunities to build your network of professionals and peers."



Follow this QR code for instructions on how to join the MAA

For instructions on how to join, follow the link below or the QR code above. Hey, what have you got to lose? It's free! <https://www.union.edu/document/maa-student-membership>

Get Involved! The Math Club. Putnam Exam Preparation.

- **Math Club** is having its first event of the year this **Friday, September 19, at 4:15pm**, in **Bailey 204, the Math Common Room**. After introductions, club members will be working collaboratively to solve three logic puzzles. And there will be pizza and drinks! Join the fun!!
- **Putnam Exam Preparation**. Do you like solving interesting problems? Are you looking for a challenge? Do you want to solve those problems and face those challenges with a group of like-minded students? **Join the Union Problem-Solving Group!**



Putnam Problem-Solving Group

The William Lowell Putnam Mathematical Competition, aka, The Putnam Exam, will be held December 6, 2025. It is an annual contest for undergraduate students across the United States and Canada, run by the Mathematical Association of America (MAA). Participants in the contest spend 6 hours (in two sittings, a morning session and an afternoon session) trying to solve 12 problems. Problems on the "exam" are generally *quite challenging*, but not specialized. In other words, they are accessible to students who may or may not have taken advanced courses. If you enjoy "playing with math", check this out!

Here is a problem from last year's contest: Let n and k be positive integers. The square in the i^{th} row and j^{th} column of an n by n grid contains the number $i+j-k$. For which n and k is it possible to select n squares from the grid, no two in the same row or column, such that the numbers contained in the selected squares are exactly $1, 2, \dots, n$?

Professor Grant Moles (molesg@union.edu, office: Bailey 101C) will be leading fun problem-solving sessions on **Thursdays** from **4:00 – 5:30 pm** in **Bailey 100**. Even if you are not interested in the Putnam competition, feel free to make new math friends and solve problems.

Recent Graduates: stay in the loop. Email Sara Drummond (drummons@union.edu) or Professor Paul Friedman (friedmap@union.edu) with an updated email address to continue receiving the math newsletter.

Calculus Help Center: free peer tutoring in calculus
 Sunday through Thursday nights, 7:30-10:00pm, Sorum House Seminar Room