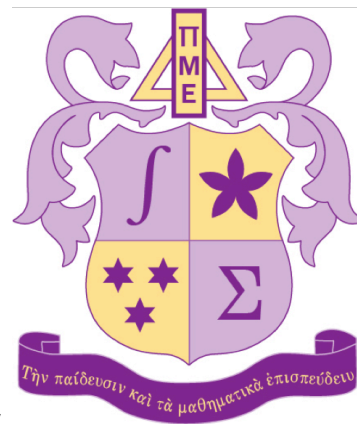


Pi Mu Epsilon – Application Deadline on Friday, May 1

Pi Mu Epsilon (PME) is a national undergraduate math honors society. In Spring 2013, a chapter of PME was established at Union College. Now we are looking to induct new members who have demonstrated an ability and interest in mathematics consistent with PME's purpose and goals.

To be considered for membership into Union's chapter of PME, a student must have

- taken at least two math courses at the 200-level or above;
- a minimum campus-wide GPA of 3.0 and a minimum GPA of 3.0 in all math courses that can be used to fulfill a math major;
- a demonstrated engagement and involvement, while at Union College, in the promotion of mathematics at Union College and/or broader community, (examples include, but are not limited to, active involvement in the Union College Math Club, in the Association of Women in Mathematics, in the Hudson River Undergraduate Mathematics Conference, in the Calculus Help Center, in math tutoring through the Kenney Center; regular attendance at the Union College Math Department Seminar);
- an interest in joining PME, demonstrated by writing a few paragraphs/mini-essay in an email to **Professor Paul Friedman** (friedmap@union.edu) explaining your interest, your qualifications, and how you have supported and will continue to support the purpose and goals of PME. This email must be received by **noon on Friday, May 1st**.



The national initiation fee for PME is \$30. This covers the cost of membership and also a one-year (two issue) subscription to the MPE Journal. Members of MPE can also purchase other PME items such as tassels for graduation, t-shirts, etc. For more information, go to the website pme-math.org.

Senior Writing and Pieces from Thesis

This week, we have two contributions. The first is from **Ryan Baldwin**, who wrote a two-term thesis under the direction of **Professor Christina Tønnesen-Friedman**, and the second is from **Tom Harrison**, who participated in the Senior Writing Seminar with **Professor Brenda Johnson**.

Pieces from Thesis, by **Ryan Baldwin**. *I had the pleasure of completing my senior thesis under the guidance of Professor Tønnesen-Friedman over the course of the past fall and winter terms. My research was concerned with concepts in differential geometry, a field that draws from a wide range of concepts covered in calculus, linear algebra, and even abstract algebra classes. This made my final project feel like a true capstone of my Union math experience: a collage of all the skills and knowledge I had gained from each of the courses I had taken.*

As someone who is not pursuing a career in mathematics, I don't anticipate that my knowledge of metrics and manifolds will be directly relevant to my future career, nor do I even expect the content of my research to be particularly interesting to any non-mathematicians. However, I don't think this type of thinking should dissuade one from completing a senior thesis. Thesis provided me with an opportunity to develop skills that a standard course could not; I became much more comfortable setting personal deadlines for myself, reading graduate-level material, and editing for long periods of time. These experiences are challenging, but also uniquely rewarding compared to other types of coursework. I do not claim to be an expert on post-graduate life, but whatever your plan for after graduation is, I would guess it's almost certain to require you to take on more independent

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responsibility than an undergraduate course would. Thesis allows one to gain experience in such an environment while simultaneously acting as a nice tribute to the aspects of your Union math career you found most interesting. I would highly recommend anyone pursuing a math major to at least consider doing one, as I found the experience to be invaluable.

And now for **Tom Harrison's** article about his senior writing experience.

I had the pleasure of participating in the senior writing seminar (Math 487) with Professor Johnson. Unlike the typical math course at Union, Math 487 traditionally has no more than 8 students; our class consisted of 5. We learned the ins and outs of formal mathematical writing as well as how to deliver a quality mathematical lecture. It was a close-knit community that provided a poised and warm learning environment. This made for an extremely nice senior thesis experience.

As mentioned, delivering an effective presentation is a primary objective of Math 487. This was undoubtedly one of the more challenging components of the class and something that I had taken for granted throughout my time at Union. After delivering my first lecture to the class, I really came to appreciate all the amazing lectures math professors had given over the years. I often burnt valuable time by over-engaging the audience or digressing on a particular topic. I burnt board space by writing too large or giving too many examples. Efficient use of board space, engagement with the audience, and time maximization are only a few of the many mechanics behind an effective presentation. It's also very easy to get too involved in your board work or presentation and consequently you forget to interact with the audience and vice versa. So, there are so many considerations the presenter has to incorporate before and during a lecture that render it a very involved process. With that said, by the end of the seminar, our presentations were crisp and foolproof; the training we had received over the 10 weeks was apparent.

One of the nicest aspects of Math 487 was the fact that we had a wide range of project topics to choose from. Since the seminar is algebra-focused, these topics were connected to underlying group theoretic subjects. I've been a guitarist my whole life and therefore wanted to pursue research that incorporated both algebra and music. In music, a useful way to interpret harmonic structures is via their symmetries in Dihedral groups. My project explored such structures and popular chord compositions as well as their behavior under transformations in dihedral groups. I had to call upon a range of topics from preceding math courses, especially Math 332, to justify results throughout my research. Such being the case, there was a sense of self-accomplishment associated with being able to apply material from prior classes in nontraditional math settings.

My senior writing experience was a blast. It challenged us to utilize topics that we had learnt earlier but in an increasingly comfortable setting. I had the added bonus of working with such a nice group which made for a grand time. As a result, I have drastically improved as a mathematical writer, presenter, and logician too! These are highly valuable skills that are useful in many day-to-day settings. I've had a great run throughout my Union math experience and Math 487 was the cherry on top.

Problem of the Newsletter – April 27, 2020

Here is a cute little geometry problem (found on Facebook!). In the circle depicted to the right, solve for angle X.

Submit your solution to **Professor Paul Friedman** (friedmap@union.edu) by noon on Friday, May 1.

Solve for angle X

