

Emma E. Gruner

326 Swords Hall
College of the Holy Cross
Worcester, MA 01610
(717) 578-9995
egruner@holycross.edu

EMPLOYMENT *Visiting Assistant Professor*
College of the Holy Cross, Worcester, MA
August 2026 - Present

EDUCATION *Ph.D., Mathematics*
Penn State University, University Park, PA
August 2026

Bachelor of Arts, Mathematics (Summa cum Laude)
Gettysburg College, Gettysburg, PA
May 2020

TEACHING EXPERIENCE

CREDENTIALS *Teaching Associate Status*
Mathematics Department
Penn State University, University Park, PA
Summer 2025
Higher teaching certification offered through the Penn State math department, based on faculty recommendations, student course evaluations, sample lecture materials, and a written essay on teaching philosophy.

Graduate Teaching Assistant (GTA) Training Program
Mathematics Department
Penn State University, University Park, PA
Spring 2021
Semester-long training course on effective teaching. Included discussions on policy and pedagogy, observations of experienced instructors, and preparations of sample lectures and course materials.

COURSES TAUGHT Served as the instructor of record for the following Holy Cross math courses. Held and planned all lectures, designed and graded all assignments, and managed all communication with students.

MATH 135: Calculus 1 Fall 2026

MATH 136: Calculus 2 Fall 2026

Served as the instructor of record for the following Penn State math courses. Held and planned all lectures, graded quizzes and exams, and managed all communication with students.

MATH 140: Calculus w/ Analytic Geometry I Fall 2023, 2024, 2025

Remark: MATH 140 is the first course in the main calculus sequence at Penn State.

MATH 21: College Algebra I Fall 2021, 2022

Remark: Also served as the assistant coordinator for this course (see “Other Teaching Experience”) during the Fall 2022/Spring 2023 academic year.

The following summer courses at Penn State are taught at an accelerated schedule with additional instructor responsibilities and limited course coordinator oversight. Teaching appointments are awarded on a competitive basis.

MATH 21: College Algebra I Summer 2021, 2025

Remark: Summer 2021 semester was taught remote synchronous.

MATH 26: Plane Trigonometry & Applications Summer 2024

MATH 220: Matrices Summer 2023

MATH 22: College Algebra II & Analytic Geometry Summer 2022

OTHER TEACHING EXPERIENCE/ SERVICE

Mathematics Courses Accessibility Project Fall 2025 - Spring 2026
Penn State University, University Park, PA

Working on a team to prepare accessible materials for Penn State’s math courses, compliant with ADA Title II. Position involves converting PDF documents to HTML, writing long text descriptions for images with the aid of AI, and assisting other faculty members with the conversion process.

All Math Review Spring 2025
Penn State University, University Park, PA

Assisted students from a variety of math courses during a three hour drop-in review session before finals week.

Math Department Alumni Panel Oct. 13, 2023
Gettysburg College, Gettysburg, PA

Visited undergraduate math courses with other Gettysburg alumni to discuss our career paths post-graduation.

MATH 21 Coordinator Assistant Fall 2022 - Spring 2023
Penn State University, University Park, PA

Assisted with course management duties for College Algebra I, including writing exams, discussing course content/logistics with the faculty coordinator, and leading meetings with other course instructors.

TEACHING WORKSHOPS & SEMINARS

Teaching Conversation Group
College of the Holy Cross, Worcester, MA

Fall 2026

Attended a weekly discussion group with other math and computer science faculty to discuss a variety of topics related to teaching and course management.

Mathematics Department Teaching Workshop
Penn State University, University Park, PA

May 2025

Attended meetings and presentations during a two-day workshop focused on a variety of teaching topics, from technology to pedagogy.

Graduate Teaching Community
Penn State University, University Park, PA

Spring 2024 - Spring 2025

Attended seminars and participated in discussions on teaching-related and professional development topics with graduate students from across Eberly College of Sciences.

RESEARCH & ACADEMICS

PAPERS

Gruner, Emma and Jan Reimann. "A Baire Category approach to Besicovitch's Theorem and measure regularity." Submitted for publication, 2026.

Reimann, Jan, Raymond Tana, and Emma Gruner. "Algorithmic information theory for net spaces." In preparation.

Calvert, Wesley, Emma Gruner, Elvira Mayordomo, Daniel Turetsky, and Java Darleen Villano. "Normality, relativization, and randomness." *Theory of Computing Systems* 69, no. 3 (2025): 26.

Johnson, Charles R., and Emma Gruner. "The inverse characteristic polynomial problem for trees." In *Operator Theory, Functional Analysis and Applications*, pp. 329-351. Cham: Springer International Publishing, 2021.

INVITED TALKS

A Baire Category Approach to the Besicovitch Theorem
New England Recursion and Definability Seminar (NERDS),
Fall 2026
Wellesley College, Wellesley, MA

Oct. 18, 2026

A Baire Category Approach to the Besicovitch Theorem
AMS Fall Central Section Meeting, Fall 2025
Special Session on Computability Theory
Saint Louis University, St. Louis, MO

Oct. 18, 2025

Ten Years of Pennsylvania Mathematics: A Reflection
Gettysburg College Homecoming
Math Department Alumni Lecture
Gettysburg College, Gettysburg, PA

Oct. 3, 2025

A Baire Category Approach to the Besicovitch Theorem

Sept. 4, 2025

Online Logic Seminar (hosted at Southern Illinois University)
 On Zoom: <http://lagrange.math.siu.edu/calvert/OnlineLogicSeminar.html>

Analyzing Borel Combinatorics in HYP Apr. 5, 2025
 AMS Spring Eastern Section Meeting, Spring 2025
 Special Session on Computability Theory
 University of Connecticut Hartford, Hartford, CT

Analyzing Borel Combinatorics in HYP Mar. 2, 2025
 Southeastern Atlantic Logic Symposium (SEALS), Spring 2025
 University of Florida, Gainesville, FL

OTHER TALKS *A Baire Category Approach to the Besicovitch Theorem* Nov. 4, 2025
 Logic Seminar, Fall 2025
 Penn State University, University Park, PA

Arithmetically Generic Sets in Computability Theory Oct. 1, 2024
 Logic Seminar, Fall 2024
 Penn State University, University Park, PA

An Introduction to Borel Combinatorics in HYP Apr. 2, 2024
 Logic Seminar, Spring 2024
 Penn State University, University Park, PA

Π_1^1 -Completeness Oct. 4, 2023
 Logic Seminar, Fall 2023
 Penn State University, University Park, PA

*Countable Borel Equivalence Relations,
 Recursion Theory, & Randomness* Apr. 4, 2023
 Logic Seminar, Spring 2023
 Penn State University, University Park, PA

Existentially Atomic Models Oct. 11, 2022
 Logic Seminar, Fall 2022
 Penn State University, University Park, PA

The Continuum Hypothesis: An Introduction Mar. 24, 2022
 Graduate Student Seminar, Spring 2022
 Penn State University, University Park, PA

Characterizing Subsets of Abelian Groups of size $\chi(G, h) - 1$. Mar. 24, 2018
 MAA Eastern PA/DE Conference, Spring 2018.
 Temple University, Philadelphia, PA

WORKSHOPS & SEMINARS *Computability and Combinatorics 2023* May 2023
 University of Connecticut Hartford, Hartford, CT

Summer school focused on several topics in the intersection of Borel combinatorics, reverse mathematics, and computability theory.

*BIRS Workshop: A Convergence of Computable Structure
 Theory, Analysis, and Randomness* Mar. 2023

Juniper Hotel, Banff, Alberta, Canada

Participated in original research with other workshop attendees on the relativization of normal sequences.

Research Experience for Undergraduates (REU)
The College of William and Mary, Williamsburg, VA

Summer 2019

Performed original research on matrix theory and inverse eigenvalue problems under faculty guidance.

**AWARDS &
HONORS**

Association for Symbolic Logic (ASL) Travel Awards May 2024, Oct. 2024
Paul M. Doty Distinguished Graduate Fellowship (Penn State) Fall 2020
University Graduate Fellowship (Penn State) Aug. 2020 - June 2021

**OTHER
CONFERENCES**

*Computability and Mathematical Definability:
In Honor of Theodore Slaman* Oct. 2024
University of California, Berkeley, Berkeley, CA

2024 ASL North American Annual Meeting May 2024
Iowa State University, Ames, IA

2022 ASL North American Annual Meeting Apr. 2022
Cornell University, Ithaca, NY

MEMBERSHIPS

American Mathematical Society (AMS) Mar. 2025
Association for Symbolic Logic (ASL) Jan. 2023
Pi Mu Epsilon Dec. 2019
Phi Beta Kappa Nov. 2019