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Meredith Shea, PhD

Visiting Assistant Professor
Department of Mathematics, Vassar College

Academic Positions

2024-2026 **Visiting Assistant Professor**
Vassar College

2022-2024 **Visiting Assistant Professor**
Oberlin College

Education

2022 **PhD in Mathematics**
University of California, Berkeley
Thesis: Discrete Systems in Quantum and Statistical Mechanics
Advisor: Nicolai Reshetikhin

2016 **BS in Applied Mathematics**
Case Western Reserve University
Summa cum laude

Teaching Statement

I have taught a wide range of courses, from pre-calculus to advanced probability. I take pride in developing materials tailored to each class and work hard to make my classes engaging and to build genuine relationships. Across all levels, I incorporate hands-on, active learning techniques to help students engage in problem solving with their peers.

Teaching

Below is a list of classes taught at each university. Courses include their level, approximate number of students in a class, and the number of times taught.

Vassar College

2026 Probability • core • avg. 22 students (taught $\times 2$)
2026 Discrete Math • core • 15 students
2025 Sequences and Series (quarter course) • gateway • 25 students
2024–2025 Calculus I • gateway • avg. 35 students (taught $\times 3$)
2025 Calculus II • gateway • avg. 35 students (taught $\times 2$)
2024 Multi-Variable Calculus • core • avg. 35 students (taught $\times 2$)

Oberlin College

2024 Probability Models and Stochastic Processes • advanced • 10 students
2023–2024 Foundations of Calculus • gateway • avg. 15 students (taught $\times 2$)
2022–2023 Calculus II • core • avg. 25 students (taught $\times 4$)
2023 Discrete Math • core • avg. 25 students (taught $\times 2$)

University of California, Berkeley *(lead instructor only)*

2022 Pre-Calculus • gateway • 60 students
2020–2021 Linear Algebra • core • avg. 25 students (taught $\times 2$)
2018–2019 Calculus II • core • avg. 40 students (taught $\times 2$)

Additional Teaching Interests

College Algebra, Introductory and Intermediate Statistics, Introductory and Intermediate Data Science, Differential Equations, Analysis, Combinatorics, Sports Analytics, Bayesian Statistics, Mathematical Statistics.

Mentorship and Research

The following list includes formal independent study programs I have conducted with students.

Vassar College

Fall 2025	Using Tracking and Event Data to Evaluate Off-Ball Runs in Soccer
Fall 2024	Soccer Analytics and Data Vis

Oberlin College

Spring 2023	Ergodic Theory

UC Berkeley

Fall 2020	Determinantal Formulas (Directed Reading Program)
Spring 2019	Formalism of Quantum Mechanics (Directed Reading Program)
Spring 2018	Discrete Surfaces and Laplacians (Directed Reading Program)

Teaching and Professional Development

Oberlin College

Aug 2023	IDEAL Center Equity Workshop, *Virtual*
Aug 2022	Communicating Mathematics Workshop, *Cornell University (attended virtually)*

UC Berkeley

March 2022	EMPOWER: Equitable Grading Strategies Workshop, *UC Berkeley*
2021-2022	Antiracist Teaching Pedagogy Seminar

Academic Services and Outreach

Vassar College

2024–2026 Women's soccer data analyst
Worked with the Vassar women's soccer team to collect data and present information to coaching staff. Organized data, developed statistical metrics, and created visualization.

Oberlin College

2023 In charge of calculus placement
Helped rewrite calculus placement exam, helped define standards for placement into math 130/133/134, handled all student placement inquiries.

UC Berkeley

2021 Private tutor (calculus, discrete mathematics)
Spring 2019 Student spin geometry seminar co-organizer

Scholarship Interests

My research focuses on two areas: stochastic processes arising in statistical mechanics, and the application of probability and data science to sports analytics, with an emphasis on player tracking data. In both areas, I incorporate computational and simulation based approaches, where experimenting helps to engage students and can make abstract mathematical ideas tangible.

Papers and pre-prints

Below is a list of currently finished works.

- Split Two-Periodic Aztec Diamond, Ann. Henri Poincaré (2026).
- Dimer Model on the Square Lattice with Interface, arXiv (2022).
- Generalized Gelfand-Yaglom Formula for a Discretized Quantum Mechanic System, J. Math. Phys. 62, (2021).

TALKS

	Off-Ball Run Value: Evaluating Off-Ball Runs Using Spatial Data
APRIL 2026	Connecticut Sports Analytics Symposium, *University of Connecticut*
JAN 2026	American Soccer Insights Summit, *Rice University*
	Split Two-Periodic Aztec Diamond
DEC 2025	GSIRC Reunion Conference, *IPAM*
JUNE 2025	Stochastics Seminar, *University of Bonn*
	Aztec Diamond Dimer Models
APRIL 2023	Mathematics and Statistics Colloquium, *Wooster College*
MARCH 2023	Pizza Lunch Talk, *Oberlin College*
	Near Interface Asymptotics of Dimer Models
JUNE 2023	Great Lakes Mathematical Physics Conference, *Oberlin College*
OCT 2022	Probability Seminar, *Durham University*
	A Generalized Gelfand-Yaglom formula
NOV 2020	Representation theory and mathematical physics seminar, *UC Berkeley*
FEB 2020	SwissMAP winter school in mathematical physics, *Les Diablerets*

TRAVEL AND CONFERENCES

APRIL 2026	University of Connecticut, *Connecticut Sports Analytics Symposium*
JAN 2026	Rice University, *American Soccer Insights Summit*
DEC 2025	IPAM, *Geometry, Statistical Mechanics, and Integrability Reunion Conference*
JUNE 2025	University of Bonn
MAY-JUNE 2024	IPAM, *Geometry, Statistical Mechanics, and Integrability*
MARCH 2024	IPAM, *Statistical Mechanics and Discrete Geometry*
AUG 2023	Durham University
JULY 2023	Sorbonne University, *ANR Dimers Conference*
OCT 2022	Durham University
OCT 2021	SLMath (formerly MSRI), *Integrable Structures in Random Matrix Theory*
FEB 2020	Les Diablerets, *Winter School in Mathematical Physics*
NOV 2019	ETH Zurich
MAY 2019	Centre de Recherches Mathematiques (CRM), *Spring School on Faces of Integrability*
JAN 2019	UT Austin, *Between Topology and Quantum Field Theory*
JUNE 2018	CIRM, *Representation Theory, Mathematical Physics, and Integrable Systems*

AWARDS AND FELLOWSHIPS

2018	Mentored research award fellowship, UC Berkeley
2017	Outstanding graduate student instructor award, UC Berkeley
2016	George T. Hunt Award, CWRU
	To a senior outstanding in leadership, scholarship, and service.
2016	Case Alumni Award, CWRU
	To an outstanding senior mathematics major.