

Matthew Charnley

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Current Research and Teaching Interests

- Standards-Based Grading and Effect on Learning
- Class Resources for Students
- Active Learning in Large Classes
- Professional Development of Graduate Students

Education

Rutgers University

Ph.D. in Mathematics

Concentration: Partial Differential Equations

Advisor: Michael Vogelius

Piscataway, NJ

2019

University of Notre Dame

B.S. in Mathematics and Chemical Engineering

Notre Dame, IN

2013

Employment

Rutgers University

Assistant Teaching Professor of Mathematics

Piscataway, NJ

2019 - Present

Teaching Experience

Rutgers University - Commonly Taught Courses

Calculus 1 for Engineering and Physics

Calculus 2 for Engineering and Physics

Ordinary Differential Equations for Engineering and Physics

Other Courses

Topics in Mathematics for the Liberal Arts

Introduction to Probability

Precalculus College Mathematics

Calculus 1 for Life and Social Sciences

Calculus 3

Introduction to Mathematical Reasoning

Math Theory of Probability

Department Service

Rutgers Math Department

Math 10x Co-Coordinator

Piscataway, NJ

Fall 2024 - Present

- Helped to design and update course materials for the Math 10x sequence.
- Main development focused on Math 103 and Math 104.
- Tested new materials within a Math 103 course.

Rutgers Math Department

Mathematics for All Leadership Committee

Piscataway, NJ

Spring 2023 - Present

- Participated in discussions about the overall structure of the math course sequence at Rutgers.
- Built a flow-chart to illustrate the different interacting components of the course structure.
- Analyzed and contributed to reports and summaries of findings.

Rutgers Math Department

Course Coordinator - Differential Equations

Piscataway, NJ

Spring 2021 - Present

- Worked with several instructors of this course to develop the common structure.
- Developed a set of learning objectives to focus the topics taught throughout all sections.
- Revised the MATLAB assignments that are common to all sections.
- Adapted an open-source textbook to be freely available to students for this course.
- Coordinate new and experienced instructors to give a similar course to serve the engineering department, but with enough flexibility for instructors to run the course as they see fit.

Rutgers Math Department

Teaching Assistant Training Program Leader

Piscataway, NJ

Spring 2021 - Present

- Reorganized and structured the TA Training program for first-year graduate students.
- Led discussions on the structure of teaching at Rutgers, pedagogy, equity, and practices of teaching.
- Recorded students giving presentations teaching and gave feedback to help them improve.

Rutgers Math Department

Undergraduate Committee - Elected Member

Piscataway, NJ

Fall 2022 - Spring 2024

- Discussed the state of the undergraduate program with other involved individuals.
- Reviewed materials for courses in development or under revision and provide feedback.
- Supported department members looking to build courses to better serve the student population.

Rutgers Math Department

Transition to Online Teaching Committee

Piscataway, NJ

Spring 2020 - Fall 2021

- Served on the emergency committee formed to guide the department through the transition to online learning during the COVID-19 pandemic
- Ran training sessions for faculty on technological and pedagogical concerns during this transition
- Provided sample course plans and other material to colleagues to better prepare them
- Co-organized the departmental Online Teaching Seminar that came about as a result of this committee

Rutgers Math Department

P2C2 Committee

Piscataway, NJ

Fall 2018 - Fall 2021

- Worked with other members of the department to redesign the path from Precalculus to Calculus 2
- As a member of the 151 subcommittee, specifically designed content for the Calculus 1 course

Rutgers Math Department*Online Content Curator - Calculus 1 and 2***Piscataway, NJ***Summer 2020*

- Collected and structured content to be used in remote Calculus classes during Fall 2020
- Recorded videos for both Calculus 1 and Calculus 2 to replace lecture components of these courses
- Provided implementation strategies for instructors to include this material in their courses.

Rutgers Math Department*Calculus 2 Summer Session Coordinator***Piscataway, NJ***Summer 2020*

- Organized 10 sections of Calculus 2 that ran online during Summer 2020.
- Wrote suggested midterms and quizzes for all sections and common final exams.
- Determined final grade cutoffs and distributions for the course.

Professional Development

Project NExT*Fellow***MAA***Summer 2019 - Summer 2020*

- Attended and participated in MathFest 2019, JMM 2020, and MathFest 2020 as a part of the program
- Facilitated a session at JMM 2020 on “Math for Non-Math Majors”
- Facilitated a session during an online MathFest 2020 replacement on “Active Learning in Challenging Classrooms”
- Attended professional development sessions on a wide variety of topics with similarly motivated instructors

<https://www.maa.org/programs-and-communities/professional-development/project-next>

Rutgers Academy for the Scholarship of Teaching and Learning*Fellow***New Brunswick, NJ***Fall 2016 - Present*

<http://rastl.rutgers.edu/>

Mentoring Experience

Rutgers Math Department*Teaching Assistant Training Program Leader***Piscataway, NJ***Spring 2021 - Present*

- Hold meetings at the start of every semester to meet with new Teaching Assistants and make sure they feel prepared for the semester.
- Give guidance on course policies, department resources, and best practices for new Teaching Assistants.

Rutgers Math Department*Summer Session Head TA***Piscataway, NJ***Summer 2016 - Summer 2018*

- Conducted observations and provided formative assessment for graduate students teaching classes over the summer.
- Advised on how to improve teaching before the summative review at the end of the course.

Honors and Awards

Rutgers University Libraries*Open and Affordable Textbooks Award**Summer 2021***Rutgers University School of Arts and Sciences***Distinguished Contributions to Undergraduate Education**2019, 2022***Rutgers University Math Department***TA Teaching Excellence Award**Spring 2018*

Research Experience

Rutgers University

Course Coordination Study

Conducting a survey to analyze how different STEM courses run their coordination efforts, including structure, practices, and compensation. *Data collection scheduled for Fall 2024.*

Piscataway, NJ

Summer 2024 - Present

Rutgers University

Standards-Based Grading and Learning

Preparing a study and analysis of how a standards-based approach to grading in differential equations affects student learning and opinion of grades. *Data collection to begin in Fall 2024.*

Piscataway, NJ

Summer 2023 - Present

Rutgers University

Student Resource Use in Early STEM Classes

Studied the different resources that students use in their introductory STEM classes, how these relate between the different departments, and how the courses can be structured to encourage the correct type of use.

Piscataway, NJ

Spring 2022 - Present

Rutgers University

Online Transition of Active Learning Recitations

Developed a survey to investigate the transition of active learning recitations to the online environment during the COVID-19 Pandemic

Piscataway, NJ

Fall 2020 - Fall 2021

Rutgers University

Thesis Research

Investigated asymptotic approximation of solutions to conductivity problems with thin filaments

Piscataway, NJ

Fall 2015 - Spring 2019

Publications

1. Kerrigan, J., Cochran, G., Tabanli, S., **Charnley, M.**, & Mulvey, S. (2022). Post-COVID Changes to Assessment Practices: A Case Study of Undergraduate STEM Recitations. In *Journal of Educational Technology Systems* (Vol. 51, Issue 2, pp. 192–201). SAGE Publications. <https://doi.org/10.1177/00472395221118392>
2. **Charnley, M** and M.S. Vogelius. “A uniformly valid model for the limiting behaviour of voltage potentials in the presence of thin inhomogeneities I. The case of an open mid-curve.” *Asymptotic Analysis*. 2019. DOI: 10.3233/ASY-191553
3. **Charnley, M** and M.S. Vogelius. “A uniformly valid model for the limiting behaviour of voltage potentials in the presence of thin inhomogeneities II. A local energy approximation result.” *Asymptotic Analysis*. 2019. DOI: 10.3233/ASY-191554
4. **Charnley, M** and A. Wood. “Object identification in through-the-wall imaging via the reciprocity gap method.” *Radio Science*. 2019. DOI: 10.1029/2019RS006946
5. **Charnley, M.** and A. Wood. “A linear sampling method for through-the-wall radar detection.” 2017. DOI: 10.1016/j.jcp.2017.06.035.
6. **Charnley, M.** and A. Wood. “Through-the-wall radar detection analysis via numerical modeling of Maxwell’s equations.” 2016. DOI: 10.1016/j.jcp.2016.01.039.
7. Andreatta, A., **M. Charnley**, and J. Brennecke. “Using Ionic Liquids To Break the Ethanol–Ethyl Acetate Azeotrope.” 2015. DOI: 10.1021/acssuschemeng.5b01175.

Invited Talks and Presentations

1. “Small Changes to Make Lecture More Active.” Rutgers Active Learning Symposium. May 14, 2024.
2. “Effects of Standards-Based Grading on Learning and Opinions of Grades.” NE RUME Conference. Online. November 4, 2023.
3. “Implications for Academic Integrity and Teaching (Lessons Learned from Chegg).” SAS Chat GPT Virtual Roundtable. Online. February 10, 2023.
4. “Alternative Grading Schemes.” Panel run by CTAAR, Rutgers University. April 8, 2022.
5. “Re-Imagining Grading: The Whys and Hows.” Project NExT Session (Originally scheduled for JMM 2022). March 3, 2022.
6. “Reassessments.” Panel discussion as a part of the 2021 Grading Conference. June 12, 2021. Conference Program
7. “Videos for Content Delivery.” Rutgers Online Teaching Seminar. Presenter. April 10, 2020.
8. “Uniform Asymptotic Approximation of Solutions to the Conductivity Problem with Thin Open Filaments.” PDE, Complex Analysis and Differential Geometry Seminar, University of Notre Dame. Scheduled for March 17, 2020 - Postponed due to the COVID-19 pandemic.
9. “A Modern Approach to Gårding’s Asymptotics Result.” Rutgers-Camden Several Complex Variables Learning Seminar. Rutgers University - Camden Campus. March 30, 2018.
10. “An energy lemma and an application to thin inhomogeneities.” NYS Regional Graduate Mathematics Conference. Syracuse University. March 24, 2018.
11. “Flipped Classrooms for Higher Level Mathematics.” NE RUME Conference. Montclair State University. November 11, 2017.
12. “A Linear Sampling Method for Through-the-Wall Radar Detection.” Colloquium at the Air Force Institute of Technology. March 2, 2017.
13. “Numerical Simulation of Maxwell’s Equations for Radar Detection Analysis.” Brown Bag Seminar at the Air Force Institute of Technology. August 27, 2015.