Ian Ruau

Graduate Teaching Assistant
Department of Mathematics and Statistics
College of Sciences and Mathematics (COSAM)
Auburn University
Parker Hall 144 B
Auburn, Alabama 36849
Emails: ianruau@auburn.edu, ianruau@gmail.com
Website: ianruau.github.io

EDUCATION

Auburn University — **Auburn, Alabama**
Doctor of Philosophy in Mathematics — Aug. 2021 - Aug. 2027
Advisors: Dr. Wenxian Shen and Dr. Le Chen

National University of Mar del Plata — **Mar del Plata, Argentina**
Bachelor of Science in Mathematics — Mar. 2014 - Aug. 2020
Advisor: Dr. Horacio De Pasquale

National University of Mar del Plata — **Mar del Plata, Argentina**
Bachelor of Education in Mathematics — Mar. 2010 - Dec. 2015

TEACHING EXPERIENCE

Fall 2025	*Recitation Leader*, Calculus III MATH-2630, Auburn University
Fall 2024	*Recitation Leader*, Calculus III MATH-2630, Auburn University
Spring 2024	*Recitation Leader*, Calculus III MATH-2630, Auburn University
Fall 2023	*Recitation Leader*, Calculus III MATH-2630, Auburn University
Summer 2023	*Main Instructor*, Elements of Linear Algebra MATH-2660, Auburn University
Spring 2023	*Recitation Leader*, Calculus II MATH-1620, Auburn University
Fall 2022	*Recitation Leader*, Calculus II MATH-1620, Auburn University
Summer 2022	*Mathematics Tutor*, Math Tutoring Center, Auburn University
2018 - Spring 2021	*Teaching Assistant*, Algebra B, National University of Mar del Plata
2019 - Spring 2021	*Mathematics Teacher* (5 courses), A. U. Illia National School (CNAI)
2017 - 2018	*Mathematics Teacher* (2 courses), A. U. Illia National School (CNAI)

WORK EXPERIENCE & PROJECTS

Chemotaxis Simulation CLI Tool (Python) — 2025

- Python project as part of my ongoing research that simulates a chemotaxis process from a parabollic-elliptic system of differential equations.
- Central differences and the Runge-Kutta numerical method were used to improve the accuracy of the simulations while ghost points were used to treat the Neumann boundary conditions accurately.
- The simulations match theoretical results previously known, and we expect to find new properties of the solutions in our ongoing research.

Simulations on Some Surface Growth Models (Python) — 2024

- Project developed for the Applied Stochastic Processes course to simulate a ballistic deposition model.
- We could corroborate through our simulations that the growth model belongs to the universality class such as the one exhibit by the fluctuations of the KPZ equation. Indeed, different ballistic depositions of tetrominoes led to the same universality class of fluctuations.
- Although the empirical results corresponded with the expected behaviour, we could not provide a theoretical proof of the specific region where the fluctuation behaved as the ones of the KPZ equation due to the randomness of the fluctuation paths.

Chicken Behaviour via Markov Chains (Python) 2024

- Project developed for the Applied Stochastic Processes course to analize the behaviour of chickens from a real dataset provided by a Poultry Sciences graduate student.
- By analizing the behavioral data we were able to identify the significant and often ocurring sequential behavioral patterns which led us to find the stationary distribution of the Markov chain associated to the chickens' actions.

Problems of the Sturm-Liouville type associated with Lacunary Series 2020

- Thesis for the B. S. in Mathematics in which a self-adjoint Sturm-Liouville problem contains a coefficient whose Fourier series is a lacunary sequence.
- We proved that the solution of the Sturm-Liouville problem has equally spaced Fourier coefficients given by the lacunary sequence of the problem.

ATTENDANCE TO CONFERENCES/WORKSHOPS

May 2025	*Third Joint Alabama—Florida Conference on Differential Equations, Dynamical Systems and Applications,* UAB, Birmingham
April 2025	*2025 Southeast Applied and Computational Math Student Workshop,* Auburn University, Auburn
Nov. 2024	*KU Probability and Statistics Conference 2024 on Stochastic Analysis and Related Areas,* University of Kansas, Lawrence
May 2023	*Joint Alabama–Florida Conference on Differential Equations, Dynamical Systems and Applications*, Auburn University, Auburn
Dec. 2017	*V International Symposium on Nonlinear PDEs & Free Boundary Problems* Faculty of Exact and Natural Sciences of the National University of Buenos Aires

OUTREACH

- Spring 2025, Mentor for 1st and 2nd year graduate students at Auburn University
- 2025 Science Olympiad Volunteer, Helicopter Division B
- 2024 Science Olympiad Volunteer, Flight Division B
- 2023 Science Olympiad Volunteer, Flight Division C

TECHNICAL SKILLS

- Programming in Python and MATLAB
- Microsoft Office Suite (Excel, Word, PowerPoint)
- User of Linux Systems

LANGUAGES SKILLS

- Spanish: Native language
- English: Independent user
- French: Independent user