Katharine (Katie) **Faulkner**

Education

2013-2017 **B.S.** Applied Mathematical Sciences
B.A. Biology (Honors) — Bucknell University, Lewisburg, PA

2017-2019 **M.Sc.** Mathematics — The University of British Columbia, Vancouver, BC
Concentration in Mathematical Biology

Research

2017-present **Master's Thesis** — The University of British Columbia
Research mentor: Dr. Eric Cytrynbaum
My Master's Thesis in Mathematics is the formation of two models relating to lactation: one to describe the effects of the mother's physiology and stimuli from the infant on milk production, and one to describe the infant's metabolism and growth throughout the lactation period.

2016-2017 **Honors Thesis** — Bucknell University
Research mentors: Dr. Matthew McTammany and Dr. Abby Flynt
My Honors Thesis in Biology was the analysis of long-term changes in daily ecosystem metabolism in the Susquehanna River with the intent of determining when the river is a source or sink of carbon dioxide.

2016 **Analysis of Methods for Estimation of River Metabolism** — Bucknell University
Research mentor: Dr. Matthew McTammany
In this summer research project, I examined four different methods for estimating daily ecosystem metabolism on a short data set from the Susquehanna River in 2010. I analyzed the efficacy and variability of these methods, and chose the methods that would be used for future projects.

2015 **Workshop on Applications of Mathematics to Physiology and Medicine** — Duke University
Research mentor: Dr. Michael Reed
In this two week summer workshop, I worked on a project in evaluating a model for the volumes and pressures of blood in the adult and fetal human circulatory system.

Research Presentations

2019 (scheduled) **Mathematical Biology Seminar** — The University of British Columbia
I will present my research on the lactation model I developed with Dr. Cytrynbaum as well as an update on the progress of a new project on infant metabolism in a talk to the mathematical biology research group that is open to the general public.

2017 **Honors Thesis Defense** — Bucknell University
I presented my research on the analysis of methods for estimating ecosystem metabolism and results of the metabolism estimates for the Susquehanna River to receive Honors in Biology.

2016 **Susquehanna River Symposium** — Bucknell University
I presented a poster on my research on the analysis of methods for estimating ecosystem metabolism and the progress of my Honors Thesis research project.

2016 **NIMBioS Undergraduate Research Conference** — University of Tennessee, Knoxville
I presented a poster on my research on the analysis of methods for estimating ecosystem metabolism.

Honors

2013-2017 **Dean's List** Bucknell University
I have achieved semester GPAs of 3.5 or higher during six out of eight academic semesters at Bucknell University during this time period.

2017 **Honors in Biology** Bucknell University
I completed and successfully defended a thesis for Honors in Biology.

2017 **Cum Laude** Bucknell University
I graduated with a cumulative GPA above 3.5.

Teaching Experience

2017-present **Mathematics Teaching Assistant** The University of British Columbia
As a TA, I have graded assignments and exams, lead workshops, and worked as a tutor in the Mathematics Learning Center.

2018 **Facilitator Development Workshop** The University of British Columbia
I attended a workshop in which I learned how to lead an Instructional Skills Workshop and practiced my facilitation skills.

2018 **Mathematics Recitation Instructor** The University of British Columbia
As a recitation instructor, I taught small classes for MATH 180 (Differential Calculus with Physical Applications), which included teaching new content and applications of material from lecture.

2018 **Instructional Skills Workshop** The University of British Columbia
I attended a workshop in which I learned some theory of teaching and honed my instructional skills through practice and peer feedback.

2015-2017 **Mathematics Department Calculus Help Session Tutor** Bucknell University
I provided guidance and assistance with homework and studying at the drop-in help sessions offered by the mathematics department for students in all Bucknell calculus courses.

2014-2017 **Teaching and Learning Center Peer Tutor** Bucknell University
I individually tutored students in introductory mathematics courses, including Calculus 1 and 2.

2014-2017 **Teaching and Learning Center Study Group Leader** Bucknell University
I lead one study group (3-10 students) per semester for introductory mathematics courses, including Calculus 1and Statistics 1. I also assisted in the training new study group leaders.

2014-2016 **Mathematics Department Grader** Bucknell University
I graded weekly homework and lab assignments for Bucknell's Statistics 1 courses.

Relevant Courses

- Applications of Calculus to Medicine and Biology
- Endocrinology
- Mammalogy
- Genomics
- Mathematical Biology
- Methods in Applied Mathematics (Partial Differential Equations)
- Logic, Sets and Proofs
- Real Analysis
- Complex Analysis
- Introduction to Numerical Analysis
- Numerical Analysis of PDEs
- Methods of Asymptotic Analysis
- Operations Research
- Introduction to Computer Science
- Introduction to Dynamical Systems

Skills

- LaTeX
- Python
- R and RStudio
- MATLAB

Interests

- **Academic:** Partial and ordinary differential equations, working with data, ecology, genetics, endocrinology, neuroscience, biophysics, mathematical modeling
- **Personal:** Education and working with students, cooking, drawing