Curriculum Vitae
Megan Fairchild

mfarr17@lsu.edu

EDUCATION

Doctor of Philosophy in Mathematics
Expected May 2025, Louisiana State University, Baton Rouge, Louisiana

Master of Science in Mathematics
May 2022, Louisiana State University, Baton Rouge, LA *(Coursework)*
December 2018, Texas State University, San Marcos, Texas *(Thesis)*
Thesis (published): Using Knot Theory to Model and Analyze DNA Replication and Recombination.

Bachelor of Science in Mathematics
May 2016, Texas State University, San Marcos, Texas
Minor: Computer Science
Cum Laude

RESEARCH

"The Non-Orientable 4-Genus of 11 Crossing Non-Alternating Knots." Spring 2024 - arXiv
"Brunnian Braids and Their Relation to Homotopy Groups of Spheres." Spring 2022.
"Using Knot Theory to Model and Analyze DNA Replication and Recombination." Fall 2017 - Fall 2018.
"The Betti Numbers of the Data Set of the Work of Bob Ross." Fall 2018
"Analyzing Betti Numbers of Range Image Patches." Fall 2018.
"Analyzing Betti Numbers of the Zodiac Constellations." Fall 2018.
"The History of the Alexander Horned Sphere." Spring 2017.
"The History of i, the Imaginary Number." Spring 2017.
"The Eccentricity of Directed Graphs." Fall 2012.

Mentored Undergraduate Research:
"Non-Orientable 4-Genus of Torus Knots" Spring 2024 - arXiv
"Braids and Configuration Space" Fall 2023
"(1, 1)-Knots and Heegaard Floer Homology" Spring 2023

HONORS AND AWARDS

RTG recepient (2023-2024)
Pasquale Porcelli Graduate Student Academic Excellence Award (2021)
Texas State Three Minute Thesis (3MT) People's Choice (2018)
"Math in the picture" contest winner (2017 & 2018)
Academic Excellence, Department of Mathematics (2017 - 2018)
Academic Achievement, Department of Mathematics (2014 - 2016)
Dean's List (Fall 2012, Spring 2013, Spring 2014, Spring 2016)

MEMBERSHIPS

Organizer: Informal Geometry & Topology Seminar, Louisiana State University (Summer 2024-current)
Organizer: Grad Students in 4D, Louisiana State University (Spring 2023-current)
Mathematics Student Colloquium, Louisiana State University (Fall 2022 - current)
The Topology Group, Texas State University (Fall 2016 - Spring 2020)
Math Club, Texas State University (Fall 2012- Fall 2018)
Pi Mu Epsilon, Texas State University (Spring 2016 - Fall 2018)
National Society of Collegiate Scholars (Spring 2013 - Fall 2018)

TEACHING/PROFESSIONAL EXPERIENCE

Graduate Instructional Assistant - Louisiana State University August 2020 - current

Instructor - Calculus I
Lead TA - Business Calculus
TA - Business Calculus

Lecturer - Texas State University August 2019 - July 2020

Co-Coordinator of the Contemporary Mathematics Teaching Forum
Contemporary Mathematics
Co-Enroll Intermediate and College Algebra
Co-Enroll Elementary Algebra and Contemporary Mathematics

Graduate Instructional Assistant - Texas State University January 2017 - December 2018

Calculus II
Pre-Calculus
Intermediate Algebra

Undergraduate Instructional Assistant Fall 2014 & Fall 2015

Pre-Calculus

Private Tutoring/ Math Tutoring Lab at Texas State Fall 2014 - Fall 2017

College Algebra
Pre-Calculus
Calculus I, II, & III
Linear Algebra
Differential Equations
Modern Algebra/Abstract Algebra
Topology

Paper Grader Spring 2016

Modern Algebra
Introduction to Advanced Mathematics

PRESENTATIONS & TALKS

Invited Talks:
University of Nevada Reno Math Colloquium: The Non-Orientable 4-genus of Knots.
AMS Sectional FSU: The Non-Orientable 4-genus of Knots.
Formal Topology Seminar (LSU): The Non-Orientable 4-genus of Knots.

Informal Topology Seminar & Other Research Presentations:
The Non-Orientable 4-genus of Knots.
Smooth versus Topological Concordance via Whitehead Doubles.
Brunnian Braids and Their Relation to Homotopy Groups of Spheres.
Modeling DNA Replication and Recombination with Knot Theory.
Analyzing Betti Numbers of Range Image Packages.
The History of Imaginary and Complex Numbers.
The History of the Alexander Horned Sphere.
Heroes of Homology.