Curriculum Vitae
Megan Fairchild

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EDUCATION

Doctor of Philosophy in Mathematics

Louisiana State University, Baton Rouge, Louisiana   Expected May 2025

Master of Science in Mathematics

Louisiana State University, Baton Rouge, Louisiana   May 2022
Texas State University, San Marcos, Texas   December 2018
Thesis: Using Knot Theory to Model and Analyze DNA Replication and Recombination.

Bachelor of Science in Mathematics *Cum Laude*

Texas State University, San Marcos, Texas   May 2016
Minor: Computer Science

HONORS & AWARDS

FELLOW: Research Training Groups (RTG)	2023-2024 & 2024-2025
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	2012 - 2016

TEACHING

Graduate Instructional Assistant - Louisiana State University   Fall 2020 - current
    INSTRUCTOR: Calculus I
    LEAD TA: Business Calculus

Lecturer - Texas State University   Fall 2019 - Summer 2020
    INSTRUCTOR: Contemporary Mathematics
    INSTRUCTOR: Co-Enroll Intermediate and College Algebra
    INSTRUCTOR: Co-Enroll Elementary Algebra and Contemporary Mathematics

Graduate Instructional Assistant - Texas State University   Spring 2017 - Fall 2018
    INSTRUCTOR: Intermediate Algebra
    TA: Calculus II, Pre-Calculus

Undergraduate Instructional Assistant   Fall 2014 & Fall 2015
    TA: Pre-Calculus

Paper Grader   Spring 2016
    Modern/Abstract Algebra, Introduction to Advanced Mathematics

Private Tutoring/ Math Tutoring Lab at Texas State   Fall 2014 - Fall 2017
    Topology, Modern/Abstract Algebra, Differential Equations, Linear Algebra,
    Calculus I, II, & III, Pre-Calculus, College Algebra

PUBLICATIONS & PREPRINTS

Submitted for Publication:

WHITEHEAD DOUBLES AND NON-ORIENTABLE SURFACES   2024
> *Preprint:* arXiv:2410.13736

THE NON-ORIENTABLE 4 GENUS OF 11 CROSSING NON-ALTERNATING KNOTS.   2024
> *Preprint:* arXiv:2403.00996

NON-ORIENTABLE 4 GENUS OF TORUS KNOTS   2024
> *Preprint:* arXiv:2405.04737

Research Notes & Course Projects:

Brunnian Braids and Their Relation to Homotopy Groups of Spheres.   2022
Using Knot Theory to Model and Analyze DNA Replication and Recombination.   2018
The Betti Numbers of the Data Set of the Work of Bob Ross.   2018
Analyzing Betti Numbers of Range Image Patches.   2018
Analyzing Betti Numbers of the Zodiac Constellations.   2018
The History of the Alexander Horned Sphere.   2017
The History of i, the Imaginary Number.   2017

PROFESSIONAL SERVICE

MENTOR FOR UNDERGRADUATE RESEARCH:

    Led vertically integrated research course   Fall 2022-Current
> Topological Data Analysis
> (1, 1)-Knots and Heegaard Floer Homology
> Non-Orientable 4 Genus of Torus Knots
> Braids and Configuration Space

    Oversaw research via directed reading   Spring 2024-current
> Seifert Surfaces and the Knot Signature
> Homological Algebra
> 3-Manifolds and Heegaard Diagrams
> Introduction to Knot Floer Homology

CURRICULUM DEVELOPMENT:

    Co-Coordinator of Contemporary Mathematics, Texas State University Spring 2020
> Re-structured syllabus, created course material currently being used

OFFICER:

    Mathematics Student Colloquium Committee   Fall 2022 - current

ORGANIZER:

    Informal Geometry & Topology Seminar, Louisiana State University   Summer 2024-current
    Grad Students in 4D, Louisiana State University   Spring 2023-current

MENTAL HEALTH ALLY:

    GEAUX Math LSU (new graduate student orientation)   Fall 2021-current
> On the list of 'people to talk to' since Fall 2021, panelist for surviving graduate school

    Certified Ally at Texas State University   Fall 2019

WEBSITE DEVELOPMENT:

    General Exam Preparation   Summer 2024
> Created a website to help younger graduate students prepare for their general exam

COLLOQUIA, CONFERENCE, & SEMINAR TALKS

Invited Talks:

Joint Mathematics Meetings at Seattle, WA	2025
Non-Orientable Surfaces in Knot Traces	
AMS Sectional Meeting at the University of Kansas	2025
Non-Orientable Surfaces in Knot Traces	
University of Nevada Reno Math Colloquium	2024
The Non-Orientable 4 Genus of 11-Crossing Non-Alternating Knots.	
Texas State University Topology Seminar	2024
Non-Orientable Surfaces Bounded by Knots & the Knot Trace	
AMS Sectional at University at Albany	2024
Non-Orientable Surfaces Bounded by Knots & the Knot Trace	
Topology Students Workshop at Vanderbilt	2024
The Non-Orientable 4 Genus of Knots.	
Topology Conference at University of Georgia	2024
Non-Orientable Surfaces in Knot Traces.	
AMS Sectional at Florida State University	2024
The Non-Orientable 4 Genus of Knots.	
Geometry & Topology Seminar (LSU)	2024
The Non-Orientable 4 Genus of 11-Crossing Non-Alternating Knots.	

Informal Topology Seminar & Other Research Presentations:

Slicing Obstructions from 4-Manifold Theory	2024
Algebraic Knot Concordance Group	2024
The Double Branched Cover and its Relation to Non-Orientable 4 Genus.	2024
The Non-Orientable 4 Genus of Torus Knots.	2024
The Non-Orientable 4 Genus of Knots.	2023
Smooth versus Topological Concordance via Whitehead Doubles.	2023
Brunnian Braids and Their Relation to Homotopy Groups of Spheres.	2022
Legendrian Knots & DGA.	2021
Modeling DNA Replication and Recombination with Knot Theory.	2018
Analyzing Betti Numbers of Range Image Packages.	2018
The History of Imaginary and Complex Numbers.	2017
The History of the Alexander Horned Sphere.	2017
Heroes of Homology.	2017

CONFERENCES ATTENDED

AMS Sectional Meeting at the University of Kansas	March 2025
Nebraska Conference for Undergraduate Women in Mathematics	January 2025
Joint Mathematics Meetings - Seattle, WA	January 2025
AMS Sectional - University at Albany	October 2024
ICERM Braids Reunion Workshop - Brown University	July 2024
Topology Students Workshop - Vanderbilt University	June 2024
Topology Summer School & Conference - University of Georgia	May 2024
AMS Sectional - Florida State University	March 2024
Texas Geometry and Topology - Rice University	November 2023
SEC Topology - University of Alabama	June 2023

Topology Conference - University of Georgia   May 2023

LANGUAGES

Spanish   *Intermediate Speaker*
Coding: C++, Python, MatLab, HTML, LaTeX

MEMBERSHIPS

American Mathematical Society	current
Math Club, Texas State University	2012- 2018
Pi Mu Epsilon, Texas State University	2016 - 2018
National Society of Collegiate Scholars	2013 - 2018