

Joshua R. Edge

900 North Grand Avenue, Suite 61616
Sherman, TX 75090
☎ 903.813.2833
✉ jedge@austincollege.edu
🌐 joshedgemath.com

Curriculum Vitae

Education

- 2013-2019 **PhD in Mathematics**, Indiana University – Bloomington, April 2019.
Adviser: Noah Snyder
- 2015–2017 **MS in Applied Statistics**, Indiana University – Bloomington, May 2017.
- 2013–2017 **MA in Mathematics**, Indiana University – Bloomington, April 2017.
- 2008-2012 **BA in Mathematics and Spanish**, Transylvania University, May 2012.
Minor: Philosophy

Positions Held

- 2021- Present **Assistant Professor of Mathematics and Computer Science**, Austin College.
- 2019-2021 **Visiting Assistant Professor of Mathematics and Computer Science**, Denison University.
- 2013-2019 **Associate Instructor**, Indiana University – Bloomington.

Research Interests

I am currently involved with a number of applied statistical projects. I am part of the opioid research group at Denison. My current focus in that group is comparing opioid overdoses in locations with needle exchange programs to those without. I am also involved in research with the modern languages department concerning language acquisition in introductory courses. I am also collaborating with some physicians doing some applied statistics projects.

My current pure math research focuses on diagrammatic methods relating to planar algebras. I work at the confluence of a number of fields, including tensor categories, representation theory, and operator algebras. My research also has import into many other areas including quantum computing, invariant theory, knot theory, graph theory, and quantum mechanics.

Publications

- 2021 **Comparison of Vocabulary Acquisition Tests**, *Nausica Miguel Marcos, Joshua Edge*, In preparation..
Vocabulary acquisition in GE courses: How much can university students acquire at the end of their required courses?, *Nausica Miguel Marcos, Joshua Edge, Mary Beaton, Claudia Sanchez-Gutierrez*, Submitted for publication..
- 2020 **Classification of small virtual skein theories**, *Joshua Edge*, Submitted for publication., <https://arxiv.org/abs/2008.04294>.
Submitted for publication.
- 2019 **Prevalence of lower extremity DVT and clinically relevant factors in patients admitted to an inpatient acquired brain injury rehabilitation program**, *Joseph Porter, Andrew Dennison, Mairin Jerome, Leila Ettefagh, Joshua Edge*, Submitted for publication.
Classification of spin models of Yang-Baxter planar algebras, *Joshua Edge*, Submitted for publication, <https://arxiv.org/abs/1902.08984>.

Awards and Fellowships

- 2021-2022 **Project NExT Fellowship.**
Selective professional development program for new or recent PhDs in the mathematical sciences.
- Summer 2017 **Hazel King Thompson Fellowship.**
Competitive fellowship awarded to IU mathematics graduate students.
- Spring 2016 **Rothrock Teaching Award.**
Competitive award given to graduate students who exemplify excellence in teaching.

Teaching Experience

Austin College

- Fall 2022 **Number Theory.**
Standard course in elementary number theory. Divisibility, Diophantine equations, the Chinese Remainder Theorem, Fermat's Little Theorem, RSA algorithms, and Rings are among the topics of the course.
- Spring 2022 **Intermediate Statistics.**
A second course in statistics focused on regression. Topics include, outlier detection, model diagnostics, logistic regression, mixed models, and time series analysis. Course taught in R.
- Spring 2022 **Introduction to Python for Data Science.**
Fall 2022 Introductory programming course in Python with a focus on data science.
- Fall 2021 **Foundations of Data Science.**
Spring 2023 Survey of common methods in data science including regression, nearest neighbor analysis, dimension reduction, and other techniques. Course taught in both R and Python.
- Fall 2021 **Introductory Statistics.**
Spring 2022 Typical first major course for data analytics. One section of 20 students was taught using an active learning model. R was used in this course, and the course used a project-based assessment model.
- Fall 2021 **Modern Algebra.**
Typical undergraduate algebra course for mathematics majors. One section of 11 students was taught.
- Summer 2021 **A First Look at Data Science.**
A 3-week quarter-credit course designed to introduce students to the world of data science. R was the primary language used in the course.
- Summer 2021 **Introductory Statistics.**
Summer 2022 Typical first major course for data analytics. One section of 16 students was taught remotely using a flipped classroom model. R was used in this course, and the course used a project-based assessment model.

Denison University

- Spring 2021 **Calculus I.**
Fall 2019 Typical first major course in calculus. Class sizes of 25. Two sections on 25 students were taught.
- Spring 2021 **Applied Statistics.**
Spring 2020 Calculus-based statistics course aimed at mathematics, data analytics, and financial economics major. Topics covered include probability, regression analysis, Bayesian statistics, and time series analysis. Three sections of 20 students were taught.
- Fall 2020 **Introduction to Statistics.**
Typical first major course for data analytics. Three sections of 25 students were taught using a flipped classroom model. R was used in this course, and the course used a project-based assessment model.
- Fall 2019 **Introduction to Statistics.**
Typical first major course for data analytics. Class sizes of 25. R was used in this course.

Indiana University – Bloomington

- Fall 2018 **D116 – Introduction to Finite Mathematics I.**
- Spring 2018 First course in two-semester sequence that fulfills IU mathematical modeling requirement. Topics covered include set operations, counting, (conditional) probability, tree diagrams, Bayes' theorem, and expected value. Typical class size is 70 students. In Fall 2018, this course was taught using an active learning model.
- Spring 2015
- Fall 2014 Two sections of this course were taught in Fall 2018 and Fall 2014.
- Summer 2018 **D117 – Introduction to Finite Mathematics II.**
- Fall 2016 Second course in two-semester sequence course that fulfills IU mathematical modeling requirement. Topics covered include linear equations, systems of equations, matrix operations, Gaussian elimination, linear programming, and basic stochastic processes. Typical section has 70 students in the fall and spring and 40 in the summer. Helped develop Summer 2018 section to run as a summer course and to use an active learning model.
- Fall 2017 **V119 – A Brief Survey of Calculus.**
- Calculator-based calculus course intended for students majoring in the life sciences. Also fulfills IU mathematical modeling requirement. Standard first-semester calculus material is covered. Typical class size is 80 students.
- Fall 2017 **M018 – Basic Algebra for Finite Math.**
- Fall 2015 Eight-week course preparing students for D116 and D117. Pass/Fail course includes basic set operations, counting using combinations and permutations, arithmetic review, systems of equations, Gaussian elimination, and linear programming. Typical class size is 40 students. Four sections were taught in Fall 2015 and two sections were taught in Spring 2014.
- Spring 2014
- Summer 2015 **J110 – Introductory Problem Solving.**
- Honors section. Summer course where students develop mathematical problem solving skills. Topics covered include combinatorics, logic, induction, and basic proof techniques. Typical class size is 15 students.
- Summer 2014 **J111 – Introduction to College Math I.**
- Remedial course intended to prepare students for finite mathematics as well as pre-calculus. First-half of a typical college algebra course covering basic arithmetic, functions, linear equations, polynomials, and factoring. Typical section in the summer has 20 students.
- Fall 2013 **M014 – Basic Algebra.**
- Remedial course intended to prepare students for finite mathematics as well as pre-calculus. Typical college algebra course. Graded Pass/Fail. Typical section has 40 students.

Brescia University

- Summer 2018 **MTH250 – Introduction to Statistics.**
- Fall 2017 Eight-week online course taught for Brescia University. Required for many majors in the social sciences.
- Spring 2017 Topics covered central tendency, data presentation, basic probability, basic statistical tests (t , χ^2 , and F), simple and multilinear regression, and ANOVA. Typical class size is 10 students.
- Spring 2017 **MTH006 – Basic Math II.**
- Spring 2016 Eight-week online course taught for Brescia University. Basic algebra course covering variable expressions, linear equations and inequalities, exponents, polynomials, factoring, square and cube roots, scientific and engineering notation, elementary graphing, and measurement unit and conversions. Typical class size is 12 students.

Invited Lectures and Workshops

- Summer 2022 **Math Fest**, Philadelphia, PA, Session Organizer.
- Summer 2022 **Math Fest**, Philadelphia, PA, Project NExT attendee.
- Spring 2022 **Classification of Symmetric Trivalent Planar Algebras**, *JMM*, Seattle, Washington, Invited Lecture.
- Spring 2022 **Joint Mathematics Meeting**, Seattle, WA, Project NExT attendee.
- Summer 2021 **Math Fest**, Virtual Meeting, Project NExT attendee.
- Summer 2021 **MAA – SIAM & TRIPODS Advanced Workshop in Data Science for Mathematical Sciences Faculty**, *Brown University*, Providence, RI, Workshop participant.

- Spring 2021 **SLAC Job Panel**, *Indiana University – Bloomington*, Bloomington, IN, Panelist.
- Spring 2021 **Classification of Symmetric Trivalent Planar Algebras**, *OSU Quantum Symmetries Graduate Seminar*, Columbus, OH, Invited Lecture.
- Spring 2021 **Classification of Symmetric Trivalent Planar Algebras**, *AMS Special Session on Hopf Algebras and Tensor Categories*, Washington, DC, Invited Lecture.
- Fall 2020 **Classification of spin models coming from Yang-Baxter planar algebras**, *AMS Special Session on Monoidal Categories in Representation Theory*, Salt Lake City, UT, Invited Lecture.
- Winter 2020 **Introduction to Quantum Symmetries Workshop**, *MSRI Semester Programme*, Berkely, CA, Invited Participant.
- Spring 2019 **Classification of spin models coming from Yang-Baxter planar algebras**, *AMS Special Session on Quantum Symmetries*, Joint Mathematical Meetings, Invited Lecture.
- Fall 2018 **Classification of spin models coming from Yang-Baxter planar algebras**, *Subfactor seminar*, Vanderbilt University, Invited Lecture.
- Fall 2018 **Classification of spin models coming from Yang-Baxter planar algebras**, *Algebra and combinatorics seminar*, Loyola University - Chicago, Invited Lecture.
- Fall 2018 **Classification of spin models coming from Yang-Baxter planar algebras**, *Quantum Algebra and Quantum Topology seminar*, The Ohio State University, Invited Lecture.
- Summer 2018 **Classification of small skein theories**, *(Sub)Factors Workshop*, Maui, HI, Invited Lecture.
- Spring 2018 **Introduction to planar algebras**, *Transylvania University*, Lexington, KY, Invited Lecture.
Talk aimed at undergraduates about research area.
- Spring 2018 **Small virtual skein theories**, *AMS Special Session on Quantum Symmetries*, The Ohio State University, Invited Lecture.
- Summer 2017 **Subfactors: planar algebras, quantum symmetries, and random matrices**, *MSRI summer workshop*, Berkeley, CA, Invited Participant.
- Summer 2016 **An Introduction to Character Theory and the McKay Conjecture**, *MSRI summer workshop*, Berkeley, CA, Invited Participant.

Outreach Activities

- January 2022 **JMM Project NExT Co-Organizer**.
Along with my co-organizer, I was responsible for developing, organizing, and running six sessions on teaching, research, and outreach at the undergraduate level at the Joint Mathematics Meetings.
- January 2021 **MAA Poster Judge**.
I judged poster presentations in algebra at the January 2021 Joint Mathematics Meetings
- Summer 2020 **REU Mentor**.
I advised two undergraduates on a project involving planar algebras and highly symmetric graphs, which will result in a forthcoming paper. This work is currently ongoing as a senior research project this semester.
- Summer 2018 **REU Mentor**, Co-mentor.
Along with Noah Snyder and Patrick Chu, I advised an undergraduate on a research project involving classification of skein theories in characteristic p .
- 2016 – 2019 **Directed Reading Program**, Organizer and Participant.
Organized a program for advanced undergraduates to learn subjects not typically found in standard courses. Led a project with a student about graph theory in Fall 2016. Have organized the program beginning in Spring 2017, including selection and pairing of participants, organizing catering and end-of-semester talks, ordering textbooks, and managing program issues.
- Spring 2018 **SAT Preparatory Course**.
Fall 2017 Prepared local high school students for the math portion of their upcoming SAT.

- Summer 2018 **Jump Start Program**, Algebra Problem Session Leader.
- Summer 2017 Prepared first and second-year students for their upcoming algebra qualifying exams. Gave small lectures and prepared study guides for topics covered on the exam. Also graded and gave feedback on mock algebra qualifying exams in Summer 2016.
- Summer 2016

Languages

- English **Native Proficiency**
- Spanish **Full Professional Proficiency**