Ryan Kelly

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Education

University of Washington Tacoma — Tacoma, WA
B.S. Mathematics and B.A. Computer Science and Systems — Expected June 2027
- Major GPA: 3.98

Arizona State University — Online
Undergraduate coursework in mathematics and computer science — 2023–2025

Green River College — Auburn, WA
Undergraduate coursework in mathematics, chemistry, and physics — 2008–2011

Research Experience

Undergraduate Research Assistant, DagFlow Project — June 2026–Present
University of Washington Tacoma · PI: Dr. David Arthur
- Identified two gaps in a synthetic-data simulation engine's calibration: parameters were set without accounting for truncation, and realized signal strength (R^2) was not controlled.
- Derived closed-form maps from model parameters to the realized mean, variance, and R^2 of truncated normal data with any number of predictors; solved the resulting system by Newton-type root-finding to machine precision, with infeasible specifications screened by known variance bounds and reported by the solver.
- Implemented the method in Python for the DagFlow engine and validated it end to end through the engine's sampler: solver residuals below 10^{-12} and every calibrated cell within two standard errors of target, on test specifications the current engine refuses in 3 of 7 cases.
- Placed the method against existing moment-matching, copula, and DAG-simulation approaches across four literature reviews; its contribution is a calibration layer that adds a known conditional generating model.
- Funded position, Summer 2026; continuing as senior mathematics capstone (TMATH 450) under Dr. Arthur, through March 2027.

Research Experience for Undergraduates, Hooked on Photonics — Summer 2011
University of Washington, Seattle
- Compiled and analyzed sampling data in MATLAB for a study of arsenic concentrations in apple juice.

Manuscripts

Kelly, R. [Title TBD]. Manuscript prepared for the *Pi Mu Epsilon Journal*; senior mathematics capstone.

Teaching Experience

Calculus Collaborative Learning Seminar Peer Facilitator — Spring 2026–Present
University of Washington Tacoma · Calculus I and II
- Independently prepare and deliver twice-weekly collaborative workshop sessions for ∼15 enrolled calculus students.
- Write original worksheets and solution keys, and design group activities that reinforce lecture content and surface individual gaps for targeted in-session support.
- Calculus I (Spring 2026), Calculus II (Autumn 2026); selected from the advanced mathematics cohort; continuing through Spring 2027.

Physics and Chemistry Tutor 2010–2011
Green River College

- Delivered one-on-one and small-group tutoring in physics and chemistry to 100+ students.
- Developed accessible explanations of quantitative concepts for students from diverse backgrounds.

Private Physics Tutor 2025
Self-employed · individualized, inquiry-based tutoring for high school students

Honors

Most Outstanding Junior Spring 2026
University of Washington Tacoma, Mathematics · selected by vote of the mathematics faculty

Mathematics and Statistics Coursework

Completed

Abstract Algebra II	TMATH 403	UW Tacoma	4.0
Abstract Algebra I	TMATH 402	UW Tacoma	4.0
Foundations of Mathematical Research	TMATH 350	UW Tacoma	4.0
Mathematics Seminar	TMATH 351	UW Tacoma	4.0
Foundations of Mathematical Reasoning	TMATH 300	UW Tacoma	4.0
Applied Data Science	TSTAT 280	UW Tacoma	4.0
Applied Linear Algebra		Arizona State	A+
Engineering Statistics		Arizona State	A
Calculus I–III, Multivariable Calculus		Green River	3.9–4.0
Differential Equations, Matrix Algebra		Green River	4.0

In Progress (Autumn 2026)

Mathematics and Social Justice	TMATH 302	UW Tacoma

Planned (before matriculation)

Real Analysis I	TMATH 423	Winter 2027
Complex Analysis	TMATH 427	Winter 2027
Mathematics Capstone	TMATH 450	Winter 2027
Real Analysis II	TMATH 425	Spring 2027

Technical Skills

Scientific computing: Python (NumPy, SciPy), R · numerical root-finding, simulation, validation
Programming: Java, C/C++, MATLAB, SQL
Tools: Git, LaTeX

Other Experience

Property Manager 2011–2022
Self-employed, Kent, WA · managed residential rental properties