

Kelly MacArthur

Mathematics Instructor/Lecturer

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EDUCATION

Pursuing PhD in Mathematics, 2010-present
Dissertation Research Emphasis: Undergraduate Mathematics Education
University of Utah, Salt Lake City, UT
(*Intended graduate date: 2020*)
Overall G.P.A.: 3.992

Masters of Science in Mathematics (Applied Emphasis), 1995
University of Utah, Salt Lake City, UT
Overall G.P.A.: 4.0

Bachelor of Science in Mathematics (Applied Emphasis), 1987
Arizona State University, Tempe, AZ
Overall G.P.A.: 3.4

AWARDS

- 2004 Student's Choice University of Utah Teaching Award
 - 2009 Distinguished Teacher Award, Sigma Chi Fraternity
 - 2010 Faculty Undergraduate Teaching Award, University of Utah Mathematics Department
 - 2014 Professors Off-Campus Award, Tanner Humanities Center
 - 2015 Teaching Recognition/Award, from Center for Disability Services
 - 2017 Excellence in General Education Teaching Award
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TEACHING & LEADERSHIP EXPERIENCE

2003-present **UNIVERSITY OF UTAH MATH DEPARTMENT, Salt Lake City, UT**
Assistant Chair (since 2016) / Instructor Lecturer

Leadership & Administrative Roles:

- Coordinated/supervised all 1000-2000 level course coordinators (2012-present).
- Schedule courses, handle student complaints and manage graduate student teachers as Course Coordinator and/or Assistant Chair (Assistant Chair 2016-present).
- Coordinate all Business Math, Precalculus, and Calculus sequence courses, at various times over the last many years. Currently coordinating Business Math courses, Math1090 and 1100. (2005-present)
- Advised all math major students on undergraduate courses, as well as answered any mathematics-related question from any university student for four years as the undergraduate advisor (2008-2012).
- Implemented the first departmental prerequisite checking system/structure for the entire campus, for students entering our math courses (2010).

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- Organize and run Instructor Training for incoming funded graduate students (2010-present).
- Organize and co-teach a teaching seminar/workshop for graduate student instructors and all faculty (2016-present).
- Mentor graduate student instructors in their teaching, including observing them teach, giving them personalized feedback about their teaching, approving their exams and coaching them in handling difficult student situations.

Teaching Roles:

- Educate students in various undergraduate mathematics courses, including the Math For Elementary Education major series, Intermediate Algebra, Business Algebra, College Algebra, Trigonometry, Precalculus, Geometry for Teachers, Business Calculus, Calculus, Discrete Mathematics, Capstone Course for Pre-service Secondary Teachers and Linear Algebra.
- Helped create Math Refresher Workshops for the week before fall and spring semesters, reviewing algebra and/or trigonometry topics, namely Math10 and Math15 (2009-2013).
- Co-created (I did the actual teaching in the videos) and edited the Math Department's public lecture videos for Math1010, 1030, 1050, 1060, 1090, 1210, 1220, 2210 located at <http://www.math.utah.edu/lectures/> (2012-present).
- Created the Precalculus course, Math1080, from scratch (2011-2012).
- Created the new *online* Math1030 course, an algebra/geometry terminal course for non-STEM majors, a course meeting the general education math requirement (2015-2016).
- Organized and implemented the Utah State Math Contest for three years for over 2000 high school and middle school students across the state (2006-2008).
- Responsible for organizing the Math Department's involvement in the Ndahoo'ah American Indian summer outreach project in Mohave Valley on the Navajo Reservation (2003-2014).
- Created a math program at the Utah State Prison for both women and men students. We got all the way through the Math1010 course, Intermediate Algebra. Recruited several undergraduate students to help with the project. We taught Geometry and further Algebra after the 1010 course was over. (2013-2016)
- Negotiated phenomenal book prices with publishers for our Calculus courses, Precalculus, Business Algebra and Business Calculus. (2006-present)

Service Roles:

- Served on the Math Education committee and/or on the undergraduate mathematics curriculum committee (2003-present).
- Served as Chair of the Appeals Committee for the College of Science for three years (2013-2016).
- Currently serving as Chair of the Senate Advisory Committee on Diversity (2016-present).
- Served on General Education Curriculum Committee for the university (2017-present).
- Served on College of Science Dean Search Committee (2018-present).

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Previous Part-time Teaching Roles:

1993-2003 **UNIVERSITY OF UTAH MATH DEPARTMENT, Salt Lake City, UT**

Associate Instructor (part-time)

Created course outlines, tests, taught and tutored various undergraduate math courses, including Algebra, Trigonometry, Calculus, Differential Equations, Linear Algebra and Geometry. Received numerous congratulatory letters from Department Chair regarding my exceptional teaching achievements.

1996-2003 **OPEN CLASSROOM ELEMENTARY SCHOOL, Salt Lake City, UT**

Volunteer Math Teacher

Taught various math concepts to elementary students, grades K through 6, in both small groups and full classes. Created "Algebra Club" for 5th and 6th graders, including writing lessons and tests.

1992-1994 **SALT LAKE COMMUNITY COLLEGE, Salt Lake City, UT**

Adjunct Instructor, Developmental Studies & Continuing Education Department

Instructed students, both at the college and out at different business locations, in low level mathematics courses in preparation for College Algebra.

1984-1986 **ARIZONA STATE UNIVERSITY MATH DEPARTMENT, Tempe, AZ**

Tutor, Tutoring Center

Tutored math students in Algebra, Trigonometry and Calculus. Taught optional, self-paced courses. Proctored and graded exams.

PUBLISHED

WORKS

- "Business Algebra" text book published by Kendall Hunt, 3rd edition, 2018
- 2019 RUME Conference Proceedings, "Re-Humanizing Assessments in University Calculus II Courses"

CONFERENCES

& TALKS

Talks:

- February, 2019, "Re-Humanizing Assessments in University Calculus II Courses", Oklahoma
- February, 2019, Opening Plenary Session invited panel "Challenges and Opportunities on the Journey of Embodying our Commitment to Equity", AMTE (Association for Mathematics Teacher Educators) national conference, Florida
- January, 2019, "Activities to Build Department Culture that Supports Engaged Learning Classroom Culture" panel talk, MAA Invited Paper Session on Using Research About Teaching and Learning to Inform the Preparation of Graduate Students to Teach, Joint Math Meetings, Baltimore
- November, 2018, "Me, You and Math", University of Utah, Undergraduate Colloquium
- November, 2018, "Teacher Training & Community Building: From Graduate Student to Colleague", at CSME (Center for Science and Math Education) Exchange talk series
- July, 2018, "Answering the Call to Rehumanize Mathematics: Two Projects", PCMI Cross Program Event, Shape of the River: Equity in Mathematics Education
- October, 2016, "Equivalent Inequalities", University of Utah, Undergraduate Colloquium

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- June, 2016, "What is Probability?", University of Utah, High School Outreach Program
- January, 2015, "What is Probability?", Utah State Prison as part of an outreach program
- April, 2014, "Magic or Markov Chain", University of Utah, Graduate Colloquium
- November, 2013, "Equivalent Inequalities", UCTM conference

Conferences/Workshops:

- March, 2019, NSF/MAA CoMInDS (College Mathematics Instructor Development Source) follow-up workshop, University of Tennessee, Knoxville
- September, 2018, "Global Learning Retreat", University of Utah
- February, 2018, "Critical Issues in Mathematics Education 2018: Access to Mathematics by opening doors for students currently excluded from mathematics" workshop, MSRI
- February, 2017, RUME (a Special Interest Group of MAA, Research in Undergraduate Mathematics Education) conference, San Diego
- June, 2016, NSF/MAA CoMInDS (College Mathematics Instructor Development Source) workshop, University of Maine
- July, 2014, "Stochastic Partial Differential Equations" summer graduate school, MSRI
- May, 2014, "Frontier Probability Days", University of Arizona
- August, 2013, NSF/CBMS Conference on "Analysis of Stochastic Partial Differential Equations", Michigan State University
- UAMTE (Utah Association for Mathematics Teacher Educators) conferences/annual meetings, attended many years between 2004 and present
- UCTM (Utah Council for Teachers of Mathematics) conferences, many years between 2004 and present

PROFESSIONAL INDUSTRY EXPERIENCE

2000-2003 **PARAMETRIC TECHNOLOGY CORPORATION, Salt Lake City, UT**

Senior Software Engineer

Created mesh manipulation tools in a 3d facet modeling computer graphics software package designed for Industrial Designers. Exercised vast creative and mathematical skill to ensure software was inventive and cutting edge. Maintain sole expertise in mesh structure, data integrity, and manipulation. Received Excellence Award for outstanding performance.

1999-2000 **CIMARRON SOFTWARE, Salt Lake City, UT**

Senior Software Engineer

Designed customized workflow management software for a genetics laboratory using a three-tiered database structure with Toplink and Weblogic. Optimized existing code for re-usability. Aided in adding structure to the development group, including user interface consistency, coding standards and project definition.

1995-1999 **PARAMETRIC TECHNOLOGY CORPORATION, Salt Lake City, UT**

Software Engineer

Designed and implemented an efficient and robust polygonalization algorithm for graphically shading three-dimensional representations of surfaces with the CDRS software package. Managed regression run fixes. Restructured and optimized User Interface and event handling

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code. Fixed bugs in various areas of the software.

1988-1990 **UNITED STATES ARMY, Fort Monmouth, NJ**

Electronic Warfare Signal Intelligence Voice Interceptor

Collected, processed, reported, and tacked signal intelligence as a Persian Farsi Linguist.

Translated classified documents.
