Kimberly A. Roth

Curriculum Vitae

Department of Mathematics
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Education

PhD., Mathematics, Pennsylvania State University, Summer 2002
Advisor: Grzegorz Świątek
Budapest Semesters in Mathematics, Fall 1996 and Spring 1997
B.A., Mathematics, Oberlin College, Spring 1996
Minor: Computer Science

Research Interests:

General: Dynamical systems
Specific: Complex Dynamics, measure and dimension of Julia sets

Teaching and Related Experience

Assistant Professor, Juniata College, Fall 2006- present
Taught Calculus I, Introduction to Probability and Statistics, Numerical Analysis, and Probability and Statistics.
Assistant Professor, Wheeling Jesuit University, Fall 2002 - Spring 2006
Taught Math in Society, Precalculus, Calculus I, Calculus II, Calculus III, Discrete Math, Linear Algebra, Introduction to Research Seminar, Introduction to Real Variables, Freshman Year Seminar, and Sophomore Honors Seminar. Advised students, mentored senior theses, and did service within my department and in the university.
Reader, Educational Testing Services, Summer 2004, Summer 2005
Graded Advanced Placement Calculus exams.

Graduate Assistant, Pennsylvania State University, Fall 1997 - Spring 2002
Taught independent sections of Finite Mathematics, Matrices, Multivariate and Vector Calculus, Ordinary Differential Equations, and Ordinary and Partial Differential Equations.
Teaching Training for Incoming Graduate Assistants, Pennsylvania State University, Summer 2001
Helped develop and lead the new training program for incoming mathematics graduate students.
Summerbridge Pittsburgh, Sewickley Academy, Summer 1996
Taught and designed math and computer course material for incoming seventh and eighth grade students in this program for inner-city middle schoolers. Also coordinated the computer lab for the program.

Grants and Honors

West Virginia Space Grant Consortium Mini Grant, for attending the Joint Meetings in Phoenix, Fall 2003
West Virginia Space Grant Consortium Mini Grant, for attending the Joint Meetings in Baltimore, Fall 2002
Project NExT Fellow, NExT, which stands for New Experiences in Teaching, is a national year long program of the MAA for new math faculty, Summer 2002 through Summer 2003
Graduate Assistant Outstanding Teaching Award, awarded jointly by the Graduate School, the Office of the Vice Provost and the Dean for Undergraduate Education, Spring 2002
Vollmer-Kleckner Scholarship in Science, for achieving a superior academic record, Spring 2002
Graduate Student Teaching Award, the mathematics department's award for excellent teaching, Fall 2001
ZZRQ Award for outstanding achievements and contributions to the sense of community in the mathematics department, 1999.

Selected Courses taught

Math in Society, Fall 2003
A course for liberal arts students with many students in elementary education. Topics came from graph theory, geometry including tiling, voting theory, apportionment, and statistics. Used computer programs such as Fathom and Tesselmania for increasing student understanding.

Precalculus, Fall 2002, Spring 2003, Fall 2004, Fall 2005
Course in functions and trigonometry. Emphasized definitions and understanding rather than just memorization.

Calculus I, Fall 2002, Spring 2003, Fall 2003, Fall 2004, Fall 2005, Fall 2005
A first course in calculus including early transcendentals. Included group work in class for applied problems and more complicated processes.

Calculus II Spring 2003, Spring 2004
A traditional second course in calculus including series. Included group work in class for hyperbolic trigonometric functions and distinguishing between techniques in integration and series testing.

Calculus III, Fall 2002, Fall 2003, Fall 2004
Course in multivariate and vector calculus primarily for mathematics and physics majors. Instituted short process and definition quizzes to help with knowledge retention.

Introduction to Probability and Statistics, Fall 2006
A calculus based introduction to probability and statistics. Used labs with student chosen data to bring practical experience to the class.

Discrete Math, Fall 2005
Course for math and computer science majors with topics including logic, introduction to proof, combinatorics, and graph theory. Did labs using Mathematica throughout the course.

Linear Algebra, Spring 2004, Spring 2005
Course in computational and theoretical linear algebra for math and science majors. Used computers throughout the course to simplify routine calculations and allow for deeper understanding of concepts.

Introduction to Research Seminar, Spring 2004, Spring 2005
A course designed to aid junior math majors in preparing for their senior thesis. Students learned LaTeX and how to read, speak, and write about mathematics. Developed a course emphasizing skills and cuminating in a final presentation and paper.

Introduction to Real Variables, Spring 2005
A course in introductory real analysis. Students did independent projects with in class presentation to teach their peers.

Freshman Year Seminar, Fall 2003
Taught a freshman year seminar called "Music from Many Perspectives: from Math to Rap and a Little History". The seminar emphasized college success strategies and study skills by using these skills while learning about music. Topics discussed included banned music, the physics of sound, music piracy, and basic music theory.

Sophomore Honors Seminar, Fall 2004, Spring 2005
Organized and facilitated the sophomore honors seminar entitled "Food: consuming and being consumed", The seminar, which is part of the Laut honors program, emphasized the many connections of food with other disciplines from chemistry to history.

Publications

"Non-uniform Porosity for a Subset of Some Julia Sets.", to appear in the refereed proceedings of Complex Dynamics: 25 years after the first appearance of the Mandelbrot Set, published in the Contemporary Math Series of the AMS, 2006.
"Julia Sets that are Full of Holes", submitted to the Mathematical Intellegencer, 2004.
"Teaching outside my comfort zone", Cardinal Perspectives 2004-2005.

Selected Conferences and Talks:

January 2007, Joint Mathematics Meetings, New Orleans.
September 2006, 2005, 2004, 2002, Allegheny Mountain Section NExT Meeting, University of Pittsburgh.
April 2006, Allegheny Mountain Section Meeting, Juniata College.
June 2005, The Budapest Semesters in Mathematics All Class Reunion and Math Conference, Budapest, Hungary.
April 2005, Allegheny Mountain Section Meeting, Slippery Rock University.
January 2005, "Introduction to Research Seminar: getting students to read, write and talk about mathematics", Joint Mathematics Meetings, Atlanta, Georgia.
June 2004,"Non-uniform porosity for a subset of some Julia sets.", Complex Dynamics: 25 years after the first appearance of the Mandelbrot Set, a Joint AMS, SIAM, and IMS Summer Research Conference, Snowbird.
April 2004,"Introduction to research seminar: a new course in the math major". Allegheny Mountain Section Meeting, West Virginia Wesleyan College.
January 2004, "Julia Sets that are Full of Holes", Joint Mathematics Meetings, Phoenix, Arizona.
July 2003, Project NExT Workshop and Mathfest, University of Colorado, Boulder.
June 2003, Dynamics in the Complex Plane: a conference in honor of Bodil Branner, Holbæk, Denmark.
April 2003, "Testing Definitions: the Beginnings of an Exploration", Allegheny Mountain Section Meeting, Pennsylvania State University Dubios Campus.
January 2003, Joint Mathematics Meetings, Baltimore, Maryland.
July 2002, Project NExT Workshop and Mathfest, University of Vermont.

Other

Proficient in LaTeX and HTML.

Programming experience in Scheme and C.

Past member of several choirs including the State College Choral Society, the Penn State Concert Choir, and the Oberlin College Choir. Currently a member of the Juniata College Choral Union.

Amateur wheel-thrown potter