TAMARA B. VEENSTRA

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EDUCATION

Dartmouth College, Ph.D. Mathematics, 1997, A.M. Mathematics, 1994
Dissertation: *Characterizing Siegel Modular Forms* Advisor: Thomas Shemanske

University of North Carolina at Chapel Hill, B.S. Mathematics, 1992

PROFESSIONAL EXPERIENCE

Full Professor, University of Redlands, 2011-present, *Associate Professor,* 2003-2011, and *Assistant Professor*, 2001-2003.

- Current research interests include number theory, mathematical cryptology and communications security, machine learning and data science especially computational projects involving SageMath and Python.

- Teach undergraduate mathematics courses focusing on active learning strategies and ranging in level from general education to upper-level such as First Year Seminars, Calculus, Abstract Algebra, Number Theory, Complex Analysis, Geometry and Machine Learning.

- Design and teach non-standard mathematics courses and interdisciplinary courses. Mathematics courses include mathematical cryptology (sophomore math major level), the mathematics of origami (general education level), and the mathematics of symmetry and pattern (general education level). Interdisciplinary courses include historical codes and ciphers (general education level and senior interdisciplinary honors [Proudian program] level) and a first year seminar course analyzing fantasy novels (general education level).

- Supervise numerous independent studies and student research projects involving the mathematics of cryptology, elliptic curves, mathematical origami, and other areas.

Senior Staff, Hampshire College Summer Studies in Mathematics, Amherst, MA, Summer 2004.

Taught 3-week course in number theory including algebraic number rings, elliptic curves, and modular forms for an intensive residential math enrichment program for high-school students.

Assistant Professor, University of Northern Iowa, 1997-2001.

- Taught undergraduate courses ranging from general education to upper level mathematics major courses including Calculus, Modern Algebra, and Number Theory.

- Designed and taught several new courses: analysis for business students, math for biological sciences, (both college algebra courses designed to incorporate applications to make the math more relevant) and an honors (non-major) seminar in cryptology.

- Supervised many independent studies and student research projects with topics including cryptography, generalized Fibonacci sequences, and a variety of other topics.

HONORS AND AWARDS

Virginia Hunsaker Innovative Teaching Award, University of Redlands Faculty Award, 2018.

Digital and Online Learning Grant, for "Technology Support to Enhance Online Learning in Calculus I", University of Redlands President's Task Force for Digital and Online Learning, Spring 2015.

Faculty Research Grant, "Historical Cryptology Research Trip", University of Redlands, 2014.

Invited Conference Participant and Travel Grant Recipient, NSA Women in Mathematics Symposium, May 2009.

Invited Speaker and Travel Grant Recipient, AAAS (American Association for the Advancement of Science) Symposium on "Mathematics of Origami: From the Joys of Recreation to the Frontiers of Research", February 2009.

Cryptography Workshop Funding Recipient, Institute for Pure and Applied Mathematics, UCLA. Selected to participate in workshop on open problems and research in cryptography. Fall 2006.

Provost's Mini-Grant, University of Northern Iowa, Summer 2000: Received funding for a two week project entitled "Integrating Math and Biology: Continuing Course Revision and Teacher Reflection".

Graduate College Project Grant, University of Northern Iowa, Spring 2000: Received funding to conduct study on the effect of the pilot course, Math for the Biological Sciences.

Presidential Scholar Seminar, University of Northern Iowa, Spring 2000: One of six faculty (per year) selected from a university wide pool to design and teach a semester-long Presidential Scholar Seminar.

Project NExT Fellow, 1997-1998: Chosen to be a member of a national program sponsored by MAA and Exxon. The focus of this program is to support young mathematics faculty in their effort to improve the teaching and learning of undergraduate mathematics.

PUBLICATIONS (2009-PRESENT)

Cryptology by Discovery: An Introduction to Conjecture and Proof, Open Educational Resource Textbook, http://bulldog2.redlands.edu/fac/tamara_veenstra/cryptobook/crypto-book.html, Fall 2020.

"Do the Twist! (on polygon-base boxes)," with s-m belcastro, College Mathematics Journal, November 2016, Vol 47, No 5, pp 341-345.

"Fujimoto, Number Theory, and a New Folding Technique," *Origami⁴: Proceedings of the Fourth International Meeting of Origami Science, Mathematics, and Education*, AK Peters, Natick, MA, 2009.

"Constructing Regular n-gonal Twist Boxes," with s-m belcastro, *Origami⁴: Proceedings of the Fourth International Meeting of Origami Science, Mathematics, and Education*, AK Peters, Natick, MA, 2009.

"Using Geometry to Analyze Origami", Online article at PBS News Hour Extra (Lesson plans for high school teachers that correlate with recent news, in this case, the article "In Paper Folding, Art and Science Align"), March 2009.
http://www.pbs.org/newshour/extra/teachers/lessonplans/math/origami_veenstra.html

PUBLICATIONS (2001-2009)

"The Matrix Connection: Fibonacci and Inductive Proof," with C. Miller, *Mathematics Teacher*, December 2005, Vol 99, No. 5, pp 328-333.

"College Algebra with Applications: Math for Biology", with C. Miller, *The AMATYC Review*, Spring 2003, Vol. 24, No. 2, pp 15-22.

"Visions of Self in the Act of Teaching: Using Personal Metaphors in Collaborative Study of Teaching Practices," with M. Heston, L. Fitzgerald, K. East, and C. Miller, *Teaching and Learning: The Journal of Natural Inquiry & Reflective Practice*, Summer 2002, Vol. 16, No. 3, pp 81-93.

"Fibonacci: Beautiful Patterns, Beautiful Math," with C. Miller, *Mathematics Teaching in the Middle School*, January 2002, pp 298-305.

"Siegel Modular Forms, L-functions, and Satake Parameters," *Journal of Number Theory* **87**, March 2001, pp. 15-20.

SELECTED PRESENTATIONS

Alan Turing and his Contributions to Cryptology, AMS/MAA National Meetings, Atlanta, Georgia, January 2017.

Cryptology By Discovery: Favorite Inquiry-Based Activities, AMS/MAA National Meetings, San Antonio, Texas, January 2015.

Investigating the Mathematics of Folding Regular-Polygon-Base Boxes. AMS/MAA National Meetings, San Antonio, Texas, January 2015.

The appeal of Origami from a Mathematician's Perspective, faculty forum, University of Redlands, February 2010 and modified for presentation to guests of Board of Trustees, Morey Mansion, February 2010.

Paper folding, Orders of Elements, and Binary Representations of Fractions, MAA invited paper session, AMS/MAA National Meetings, San Francisco, CA, January 2010.

How a Mathematician Looks at Origami and Finds Prime Numbers, invited speaker, AAAS National Conference, Chicago IL , February 2009.

The Vigenere Cipher: A Historical Cipher with a Modern Day Application, AMS/MAA National Meetings, Washington DC , January 2009.

Generalizing Twist Boxes, 4OSME Conference (4th International Conference on Origami in Science, Mathematics and Education), Pasadena CA, September 2006.

A Number Theory Application to Origami, AMS/MAA National Meetings, January 2006, California State Polytechnic University at Pomona, April 2006, 4OSME, Pasadena, September 2006, and CSUB September 2007.

RECENT SERVICE ACTIVITIES (FALL 2015- PRESENT)

Departmental Service

- Assessment Chair for Mathematics Department, 2012-present
- Advisor for numerous majors and non-majors, 2001-present
- Mathematics Placement Research, 2013-2016

University Service

- Budget and Planning Committee (BPC) member and Faculty Senate (Fall 2015-Spring 2017)
- Open Educational Resources multidisciplinary faculty seminar and working group, 2017-2018.
- Open Education Resources discussion with CIC (Council of Independent Colleges) which resulted in University of Redlands including in their report *Access and Innovation: The Use of OER at Smaller Independent Colleges and Universities to Support Historically Underrepresented Students,* Fall 2021.
- Data Science Program Working Group, 2018-2021. Departmental and university wide discussions and research to determine potential for data science programs at the University of Redlands.
- Proudian Senior Seminar Instructor, Fall 2022.
- First Year Seminars, 2015, 2017, 2019, 2020.
- STEM Diversity Discussion Group, Spring 2022

Service to the Profession

- Chair, MAA (Mathematical Association of America) Committee on Panels, Poster Sessions and Workshops, February 2017-January 2020.
- Member, MAA Committee on Panels, Poster Sessions and Workshops, January 2012-2017.
- Data Collector for AWM's Notable Women in Mathematics Playing Card Project, spring 2022.
- Reviewer
  - Fixed Point Iterative Methods à la Fujimoto for *Origami*^{6}, Spring 2018
  - Unlocking Ideas: Using Escape Room Puzzles in a Cryptography Classroom, *Primus*, Fall 2017.