

Donna A. Dietz, Ph.D.  
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Education:

- 2002 Ph.D. Rensselaer Polytechnic Institute,  
Department of Mathematics, Troy, NY
- 1995 M.S. University of Massachusetts Lowell  
Department of Mathematics, Lowell, MA
- 1993 B.S. Atlantic Union College (departmental honors),  
South Lancaster, MA - Mathematics

Research:

I have usually worked in differential geometry designing interpolary planar NURBS of monotonic curvature. However, I have recently started working on problems relating to bifurcations in the induced cell complexes of a geometric optical wavefront (using a reflection-based model for waves).

Publications:

- \* "Rational Cubic Spirals", Computer-Aided Design, Volume 40 , Issue 1, pp 3-12, Donna A. Dietz, Bruce Piper, and Elena Sebe Elsevier 2007
- \* "Logic circuits laboratory for an undergraduate course in Discrete Mathematics" PASSHEMA proceedings 2007 (not peer reviewed)
- \* "Three-dimensional manipulatives for undergraduate geometry classes" SSHE-MA proceedings 2004 (not peer reviewed)
- \* "Interpolation with cubic spirals", Computer Aided Geometric Design Volume 21, Issue 2, pp. 165-180, Donna A. Dietz and Bruce Piper, Elsevier 2004 <http://www.elsevier.com/locate/cagd>
- \* Ph.D. Thesis, Rensselaer Polytechnic Institute, August 2002  
"Convex Cubic Spirals"

#### Conferences Attended:

- \* PASSHEMA Conference, March 2009, Mansfield University (talk title: *Cell Complexes Arising from Bouncing Light Rays*)
- \* PASSHEMA (SSHE-MA) Conference, March 2007, Bloomsburg University
- \* Geometric Combinatorics MSRI/MAA PREP workshop, June 2005
- \* Joint Mathematics Meetings, January 2005. Poster presentation: *Rational Cubic Spirals*
- \* SSHE-MA Conference, March 2004, East Stroudsburg University  
*Three-dimensional manipulatives for undergraduate geometry classes*  
[http://faculty.mansfield.edu/ddietz/Geometry/S2004\\_SSHEMA\\_Talk.doc](http://faculty.mansfield.edu/ddietz/Geometry/S2004_SSHEMA_Talk.doc)
- \* Moravian College Student Mathematics Conference, February 2004  
(Another professor and I took seven students to this conference where they gave research talks, which we helped them prepare.)
- \* EPADEL Section MAA meeting, November 2003
- \* Joint Mathematics Meetings, January 2003
- \* Joint Mathematics Meetings, January 2002
- \* SIAM Annual Meeting: Toronto, Canada, Summer 1998
- \* Institute for Mathematics and Its Applications,  
Cardiac Dynamics: Minneapolis, Minnesota, Winter 1998
- \* Mathematical Problems in Industry Workshop: Troy, New York, Summer 1996

#### Teaching Experience:

- \* 2009 - current      Visiting Scholar, University of Pennsylvania
- \* 2003 - 2008      Assistant Professor, Mansfield University  
Tenure and promotion to Associate granted in June 2008 contingent upon return in the Fall, but took leave of absence rather than returning.
- \* 2002 - 2003      Adjunct Professor, The College of Saint Rose
- \* 2001 - 2003      Adjunct Professor, Hudson Valley Community College
- \* 1995 - 2001      Teaching Assistant, Rensselaer Polytechnic Institute
- \* Summer 1998,      Summer 1999, Summer 2001, Fall 2001  
Instructor, Rensselaer Polytechnic Institute,
- \* 1993 - 1995      Teaching Assistant, University of Massachusetts Lowell

## Courses Taught or Now Teaching:

### University of Pennsylvania

MATH 241, Calculus, Part IV. Prerequisite(s): MATH 240. *Sturm-Liouville problems, orthogonal functions, Fourier series, and partial differential equations including solutions of the wave, heat and Laplace equations, Fourier transforms. Introduction to complex analysis.*

### Mansfield University

MA 1115, Survey of Mathematical Ideas. *A liberal arts course designed to acquaint the student with the nature and scope of modern mathematics. Emphasis is on concepts and understanding rather than the acquisition of technique. Topics included are suitable for the non-science liberal arts student. No extensive background in algebra is required.*

MA 1119, Fundamentals of Mathematical Reasoning. *This course will center on quantitative reasoning skills. The topics include deductive and inductive reasoning, critical thinking, numerical and geometrical reasoning, developing number sense, decision making under uncertainty, and mathematical communication skills. These skills will be presented and developed within the context of classical and everyday mathematical applications.*

MA 1125, Introductory Statistics. *A survey of basic statistical methods for analyzing data. Topics include descriptive statistics, probability, sampling, point and interval estimation, hypothesis tests, linear regression, correlation, and non-parametric tests.*

MA 1128, College Algebra. *Review of ideas in basic algebra, graphs, equations, inequalities, and a strong emphasis on functions (general, polynomial, rational, exponential and logarithmic).*

MA 1165, Pre-Calculus Mathematics. *Intended to prepare students for the study of calculus. Topics include functions, graphs, polynomial and rational functions, exponential and logarithmic functions, trigonometric functions and analytic trigonometry.*

MA 2231 Calculus I. *The purpose of this course is to develop a good understanding of the derivative and its uses, to introduce the definite integral, and to establish the important relationship between the derivative and the definite integral. This course is intended for mathematics, science, and engineering majors.*

MA 3260, Discrete Structures. *Foundations of mathematics, emphasizing fundamental concepts in abstract mathematics and deductive reasoning. Topics will include logic, Boolean algebra, sets, functions, relations, cardinality, number systems, abstract systems, and algorithms.*

MA 3311 Differential Equations I. *Techniques for solving ordinary differential equations, superposition principle, existence and uniqueness theorem, applications.*

MA 3312 Differential Equations II. *Additional work in partial differential equations and boundary value problems, numerical methods, qualitative treatment of differential equation in phase plane, stability issues.*

MA 3329, Modern Geometry I. *An introduction to the foundations of geometry with emphasis on the axiomatic development of the Euclidean system. Prerequisite: MA 3260.*

MA 3332, Applied Combinatorics. *Applied discrete mathematics emphasizing combinatorics and graph theory. Topics will be chosen from counting methods, generating functions, recurrence relations, inclusion-exclusion, the polya enumeration formula, graph theory, covering circuits, trees, and searching and network algorithms. Prerequisite: Calculus I*

#### The College of Saint Rose

MAT 150, For All Practical Purposes. *This course is designed for the liberal arts students as an introduction to some contemporary topics in mathematics. Topics include, but are not limited to, management science, statistics, and geometry. Especially recommended for elementary education majors. This course is not recommended for students who have had a course in operations research and/or statistics. [Prerequisite: NYS Sequential Mathematics Course 2 or equivalent. Placement contingent on placement test scores.]*

MAT 151, Excursions in Modern Mathematics. *This course is designed for the liberal arts students as an introduction to some contemporary topics in mathematics. Topics include, but are not limited to, social choice, geometry and mathematics in computers. Especially recommended for elementary education majors. May be taken before MAT 150. [Prerequisite: NYS Sequential Mathematics Course 2 or equivalent. Placement contingent on placement test scores.]*

MAT 160, Ideas in Modern Mathematics. *This course is designed for the liberal arts students as an introduction to some contemporary topics in mathematics.*

#### Hudson Valley Community College

MATH 99, Essentials of Mathematics I. *A basic preparatory course in fundamentals of algebra and trigonometry. Topics include: order of operations, operations with signed numbers, solving first degree equations in one variable and applications, operations and polynomials, solution of right triangles by the use of trigonometry and pythagorean theorem. This course will not be transferable to a four year college.*

MATH 110, Intermediate Algebra. *A review of the principles of algebra and introductory trigonometry. Topics include: operations on polynomials, first degree*

*equations, special products, factoring, algebraic fractions, exponents, radicals, quadratic equations, right angle trigonometry, and graphic linear equations. A scientific calculator may be used. This course may not transfer to a four year institution.*

MATH 120, Real World Mathematics. *A course designed for liberal arts students that emphasizes contemporary applications of mathematics. Topics include, but are not limited to: statistics, data analysis, consumer mathematics, networking, geometry and problem solving.*

#### Rensselaer Polytechnic Institute

MATH 480, Numerical Computing. *A survey of numerical methods for scientific and engineering problems. Topics include numerical solution of linear and nonlinear algebraic equations, interpolation and least squares approximations, numerical integration and differentiation, eigenvalue problems, and an introduction to the numerical solution of ordinary differential equations. Emphasis placed on efficient computational procedures including the use of library and student written procedures using high-level software such as MATLAB.*

#### Graduate Coursework:

##### \* Rensselaer Polytechnic Institute

Differential Equations (400-level), Foundations of Applied Mathematics, Perturbation Methods, Partial Differential Equations I and II, Computer Applications in Medicine and Biology, Portfolio Selection Theory, Financial and Managerial Accounting, Business Economics, Mathematical Modeling I and II

##### \* University of Massachusetts Lowell

Real Analysis, Complex Variables, Applied Math I and II, Discrete Math, Cryptography, Algebraic Structures, Numerical Analysis I and II, Topology, Functional Analysis, Mathematical Modeling

#### Awards:

\* Participation in AWM Workshop for Women Graduate Students and Recent PhDs at the Joint Mathematics Meetings, Atlanta, GA, January 2005. Poster presentation: *Rational Cubic Spirals*

\* National Science Foundation Grant, "Mathematical Sciences: Rensselaer-MITRE Graduate Research Assistantship" for 1997-1998 academic year

- Departmental Award for Creative Mathematical Thinking: 1992

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### Computing:

- \* Taught Numerical Computing
- \* Proficient in MAPLE
- \* Comfortable with Pascal, BASIC, ANSI C
- \* Minor in Computer Science
- \* Minor in Computer Information Systems

### Service:

- \* General Education Subcommittee (of Mansfield University)
- \* Treasurer of University Senate
- \* Faculty Senator for Mathematics
- \* Actively working on departmental committee for NCATE accreditation
- \* Faculty advisor for the Math Club at Mansfield University
- \* Instructor for Freshmen Seminar course
- \* Content Area Observer for several student teachers (Mansfield University BSE students who will be teaching Mathematics at the Secondary Level upon graduation)

### Other:

- \* PASSHEMA (PASSHE Mathematics Association) Webmaster March 2007 to present
- \* Reviewer for Elsevier peer-reviewed journals in field of Computer-Aided Geometric Design (eg: *Journal of Computational and Applied Mathematics*, *Computer-Aided Design*)
- \* Question writer for ETS since 2003
- \* Member of AMS and MAA
- \* Society of Actuaries, Course I Examination, score 10 (scale of 0 to 10)
- \* GRE: 790 Math, 790 Logic, 620 Verbal
- \* US Citizen

Last Update: April 1, 2009

### References:

Catherine D'Ortona, Mansfield University  
Matthew Haner, Mansfield University  
Howard Iseri, Mansfield University  
Linda Iseri, Mansfield University  
Bruce Piper, Rensselaer Polytechnic Institute

Additional references available upon request.