# Elizabeth Goode's Curriculum Vitae

Department of Mathematics
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## Education

**Ph.D. Mathematics**
**August 1999, State University of New York at Binghamton**
Co-Advisors: Tom Head and Dennis Pixton
Ph.D. Thesis: *Constants and Splicing Systems*: The thesis addresses the question posed Tom Head in 1989: Characterize DNA splicing languages.

**MA Mathematics**
Thesis: Constants and Spicing Systems
May 1994, State University of New York at Binghamton (now Binghamton University)

## Work Experience

### Associate Professor

March 2008 – Present Tenured and Promoted to Associate in 2008
Department of Mathematics, Towson University
**Primary Responsibilities**: Teaching, Research and Professional Service.

My teaching responsibilities include my "bread & butter" courses that are geared toward mathematics and computer science majors: Discrete Mathematics, Elementary Linear Algebra, Introduction to Abstract Mathematics, Abstract Algebra, Calculus. I also have taught Graph Theory, Fuzzy Logic and Finite Mathematics. I am a graduate faculty member.

Research in DNA splicing systems and DNA splicing languages is interdisciplinary by nature. I work across the fields of mathematics, biology and formal language theory – a branch of theoretical computer science. I have advised research students at the Master's and Ph.D. levels. My work with TU Applied Math graduate student William DeLorbe resulted in a refereed publication in Springer's DNA Computing Series in 2005. I was the external co-advisor through the Maryland-Malaysia Splicing Consortium in 2010-2011 for Ph.D. student (Dr.) Yuhani Yusof. Ms. Yusof earned her degree and I simultaneously developed a graduate curriculum for ma course in DNA Splicing Systems and Formal Language Theory. Our joint work led to four refereed publications.

At TU my service responsibilities currently include serving as Vice-Chair of the College Council of the Fisher College of Science and Mathematics, and acting as the Diversity Action Liaison for the Mathematics Department. I have been a member of the Molecular Biology, Bioinformatics & Biochemistry Committee, or MB3 Committee, since 2003, and my primary activity has been to mentor undergraduates with research projects. I serve on Core Curriculum Committee and as chairperson I evaluated the great majority of petitions for transfer credit that came into the department. I served as Chair during AYs 2014-15, 2013-14, 2012 – Mar 13, 2009-10, and Co-Chair in 2011-12. I also coordinated our largest course offering – MATH 111, Finite Mathematics – and developed and implemented a common final examination for Math 111. This was the first common fial exam offered for any course in the TU Mathematics Department. I chaired the Algebra & Geometry Committee in 2002-03 and 2012 – Mar 13. I served on the Applied and Industrial Mathematics Committee, and our departmental P&T Policy Committee. I was instrumental in the writing and production the TU Mathematics Department's 7-Year Program Review in 2008.

I also actively serve on the Mathematics Advisement Committee. In 2015 I helped design a beta version of TU's latest project – the "Individual Degree Completion Plan" or IDCP. I am the go-to faculty member for the advisement of Pure Mathematics and Applied Mathematics majors, and assign advisors to all of these majors. In 2016 alone I advised 32 students in the creation of their IDCPs. I disseminate information to faculty about creating and reporting advisee IDCPs. I am also currently the faculty member available to assist other faculty in the use of our new Student Success Collaborative Campus software, called SSC Campus, which is our best tool for identifying students who are at risk, and reaching out to them to help.

### Assistant Professor

August 2002 – March 2008
Department of Mathematics, Towson University
**Primary Responsibilities:** Teaching, Research and Professional Service. Courses taught include Calculus w/ *Mathematica*, Elementary Linear Algebra, Discrete Mathematics, Graduate-level Fuzzy Logic, Finite Mathematics, Developmental Mathematics, Euclidean and Non-Euclidean Geometry and Graph Theory.

## Recent Service for Towson University's Fisher College of Science and Mathematics

- Vice-Chair, FCSM College Council, 2016 – 2017. Member 2014-present.
- Student Marshall: FCSM Spring 2016 Commencement Ceremonies
- FCSM Diversity Action Liaison from the Mathematics Department: 2014 – present
- Host: Hosted 2 graduate student researchers at the ISEM Conference held at TU, April 2016

## Mentoring and Advisement

**Undergraduate Advisement**

- I assign faculty advisors to our Pure and Applied Mathematics majors.
- I currently advise 32 of our Undergraduate Pure Mathematics and Applied Mathematics Majors.

**Undergraduate Research Advisor**

- Lyndsey Dickson, 2014 – 2015: Effects of EMFs on fetal development (MB3 Program)

**Mentor/Advisor for Master's Research Projects**

- Melissa Robbins, 2005 – 2006: DNA Splicing
- William Delorbe**,** 2004 – 2005: The Dynamics of DNA Splicing Systems;

**External Co-Advisor, Ph.D. student:** External Co-Supervisor for Ph.D. candidate

- Yuhani Binti Yusof. Primary advisor, Dr. Norhaniza Sarmin, Universiti Teknologi Malaysia, 2011, DNA Splicing.

**Primary Faculty Advisor for 2011 Baltimore iGEM Team / Faculty Mentor for the 2010 Baltimore iGEM Team**

- May 2011 – Oct 2011 / May 2010- Nov 2010 Towson University, Towson, MD / CCBC, Catonsville, MD

In 2010 I served as a mentor for the Baltimore International Genetically Engineered Machine Competition Team, sponsored by MIT. In 2011 I invited the Baltimore Team to TU and was the primary Faculty Mentor. This gave TU undergraduates more opportunity to participate in this synthetic biology competition. I recruited TU undergraduates and others from DiY and hacker communities, organized planning meetings, Acquired materials, provided safety training, assisted with bench technique & experimental design, evaluated results, and taught students how to contribute to the Team's iGEM Wiki page.

## Special Projects & Awards

- **Math & Art Day:** Organizer. Spring 2014 Mathematics and Art for Baltimore high schoolers. Day included short lectures and presentations by 4 renowned artist/mathematicians, and hands-on projects for the students.
- **Sally Ride Festival** Point of Contact for Sally Ride organizers. Presenter workshop on Tetrahedron Kits. May 08.
- Certificate of Appreciation, Towson University Disability Support Services, Feb 2016
- Empire Challenger Fellowship for Teachers, 1989

## Grants Submitted

- **Baltimore IGEM Team**, 2011-2012: $35K proposal submitted with Ron Brown to local industry. Not funded.
- **NSF - Proposal No. 0511397 Co-PI** with D. Rawn, G. Gasparich, Trajkovski, 2005. Implementation of a Cooperative Project-Based Laboratory Curriculum Emphasizing the Interdisciplinary Nature of Molecular Biology, Biochemistry, and Bioinformatics. Not funded.
- **FCSM Grant Co-PI** with G. Trajkovski, 04. Development of a Bioinformatics Curriculum for MB3 Program. Funded.
- **NSF – Proposal No. 0341108 Co-PI** with M. O'Leary and J. Zimmerman, 2003. An NCTM-based geometry course for pre-service high school teachers. Not funded.
- **Internal FCSM Summer Research Grant PI** 2003. DNA Splicing Languages in the Limit. Funded.

## Refereed Publications

- (with Justin Hughes) The Sum of the first *n* perfect Cubes, *under review*, *Mathematics Magazine*, 2016.
- (with Yusof *et.al.*) Molecular Aspects of DNA Splicing Systems, ICoMEIA 2014, *American Institute of Physics Conference Proceedings*, 1660, 050045 (2015). View online: http://dx.doi.org/10.1063/1.4915678
- (with Yusof *et.al.*) An Analysis of Four Variants of Splicing Systems, *AIP Conference Proceedings*, 1522 , 888 (2013), pp. 888-895, indexed by World Scientific Publishing.
- (with Yusof *et.al.*), An Extension of DNA Splicing System(s), presented *BIC-TA 2011*, Universiti Sains Malaysia, Penang, Malaysia, September, 2011. Post-Conference publication indexed by the IEEE Xplore, Scopus and EI.

- (with Yusof *et.al*.), Hierarchy of Certain types of DNA Splicing Systems, *International Journal of Modern Physics: Conference Series*, Vol.9 (2012), pp.271-277, indexed by World Scientific Publishing.
- (with William DeLorbe), DNA Splicing Systems: An O.D.E. model with simulation, *Lecture Notes in Computer Science*, Springer, 2007.
- (with Goran Trajkovski), Developing a truly interdisciplinary bioinformatics curriculum: Work in progress, in *Journal of Computing Sciences in Colleges*, v. 22, No 6, pp 73-79, June 2007.
- (with Dennis Pixton), Recognizing splicing languages: Syntactic monoids and simultaneous pumping, in *Discrete Applied Mathematics*, Vol. 155, No. 8, pp989-1006, April 2007.
- (with Dennis Pixton), Splicing to the limit, in *Aspects of Molecular Computing - Essays Dedicated to Tom Head on the Occasion of His 70th Birthday* (N. Jonoska, G. Paun, G. Rozenberg eds.), *Lecture Notes in Computer Science*, Vol. 2950, Springer-Verlag, 2004.
- (with Tom Head and Dennis Pixton), Splicing Systems: Regularity and Below, *DNA8, Sapporo, Japan, June 10-13, 2002, Revised Papers* ( Hagiya & Ohuchi, eds.), *Lecture Notes in COSC*, Vol. 2568, pp. 262-268, Springer, 03.
- (with G. Trajkovsky), Napoleon's Soldiers, in *The Journal of Computing Sciences in Colleges*, Vol. 18, No. 5, pp193-197, Providence, RI, April 2003.
- (with Dennis Pixton), Semi-simple splicing systems, in Where Mathematics, Computer Science, Linguistics and Biology Meet, 343-352, Kluwer Academic Publishers, 2001.
  (with D. Wood and J. Chen), DNA Implementation of A Royal Road Fitness Function, DNA Computing, A. Condon and G. Rozenberg, Eds. 247-262, Springer-Verlag, 2001.
- (with K.J. Reddy*), Wet Splicing Systems*, in *The Proceedings of the Third Annual Meeting on DNA Based Computers*, H. Rubin and D. Wood, editors, University of Pennsylvania, June 1997.
- (with W. Zhang and W. Meng), A Methodology of Integrating Fuzzy Relational Databases in a Multidatabase System, *Proceedings of 5th Int. Conf. on Database Systems for Advanced Apps* (*DASFAA*), World Sci.Press, 1997.

## Recent Presentations/ Talks

- *DNA Splicing Rules: Staying True to the Biology*, Sabbatical Talk, Apr 2015, Mathematics Department, Towson University.
- *DNA Splicing Systems: A Poster Presentation of Simulation Results* and *Session Chair* at the Biomathematical Computing: Past, Present and Prospects Conference, Oct 2008, Binghamton, NY.
- *DNA Splicing Systems: An O.D.E. model with simulation* presented at the 13th Annual International DNA Computing Conference, University of Memphis, June 2007
- Jennifer Mills Lecture Series: Invited 3-Talk Series Speaker. 1. *DNA Computing*; 2. *DNA Splicing to the Limit*; 3. *Splicing languages, constant words and the syntactic monoid* , Kalamazoo College, MI, May 7-8, 2007
- *Developing a truly interdisciplinary bioinformatics curriculum: Work in progress* by E. Goode and G. Trajkovski. Consortium For Computing Sciences in Colleges, Rochester Institute of Technology, April 2007

## Other Work Experience

- **Visiting Assistant Professor**

August 2000 – August 2002, Department of Mathematical Sciences, University of Delaware, Newark, DE
Primary Responsibility: Teaching. I taught Calculus I and Discrete Mathematics in the fall of 2000, and Discrete Mathematics and Finite Mathematics in the spring and summer of 2001.

- **Postdoctoral Fellow**

August 1999 – August 2000, Computer and Information Sciences Dept, University of Delaware, Newark, DE
Primary Responsibilities: Cross-disciplinary research, writing, and presentation of research. My project was the implementation of evolutionary algorithms *in vitro* using DNA. I was involved in cross-disciplinary research in DNA computing and collaborated with co-principal investigators in computer science and biochemistry. Eighty percent of my time was spent at the bench, and the rest of my time was spent writing, reviewing the literature, and presenting results.

- **Research/Teaching Assistant**

Fall 1992 – August 1999, Department of Mathematical Sciences, SUNY at Binghamton, NY
Primary Responsibilities: Research, writing and teaching. I engaged in theoretical and laboratory research on DNA splicing systems, producing a conference proceedings publication. I engaged in research involving fuzzy relational database theory, generating a conference proceedings publication. I taught Calculus in 1992, 1993 and 1995, and led a graduate seminar in Formal Language Theory in 1994.

- **Adjunct Lecturer**

August 1991 – May 1992, Mathematics Department, State University of New York at Cortland, NY
Primary Responsibilities: Teaching. I taught 3 sections each semester of Pre-Calculus and Algebra & Trigonometry.