

Darren B. Parker

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Education Ph.D. in Mathematics, University of Wisconsin – Madison *May 1998*

Area: Algebra Minor: Mathematics Education
Advisor Donald S. Passman

B.A. in Mathematics, Pomona College, Claremont, CA *May 1992*

Other Completed “Foundations of Online/Hybrid Course Development” training for teaching online courses.

Passed Actuarial Exam 1/P (Probability) with a score of 8.

Research My areas of research include **Graph Theory, Hopf Algebras, Coalgebras**.

Grants **Research Council SEED Grant Award**,
University of Dayton *Summers 2002, 2003, 2004*

Professional Improvement Grant, Bemidji State University *January 2001*

Experience Department of Mathematics *August 2015 – Present*
Grand Valley State University

Associate Professor of Mathematics Courses taught are College Algebra (MTH 122), Trigonometry (MTH 123), Precalculus (MTH 124), Calculus 1 (MTH 201), Communicating in Mathematics (MTH 210), Discrete Structures: Computer Science 1 & 2 (MTH 225 & MTH 325), Cryptography and Privacy (MTH 312), Modern Algebra (MTH 350), Independent Readings (MTH 399), Advanced Calculus 1 (MTH 408), Senior Thesis (MTH 496).

Department of Mathematics *August 2009 – May 2015*
Grand Valley State University

Assistant Professor of Mathematics Courses taught are Trigonometry (MTH 123), Calculus 1, 2, & 3 (MTH 201, 202, & 203), Communicating in Mathematics (MTH 210), Linear Algebra & Differential Equations (MTH 302), Modern Algebra (MTH 350), Discrete Mathematics (MTH 315), Advanced Calculus 1 (MTH 408), and Advanced Calculus 2 (MTH 409 as independent study), Independent Study & Research (MTH 499).

Department of Mathematics *August 2007 – May 2009*
Grand Valley State University

Visiting Assistant Professor of Mathematics Courses taught are College Algebra, Trigonometry, Calculus 1, 2, & 3, and Communicating in Mathematics.

Department of Mathematics
University of Dayton

August 2001 – May 2007

Assistant Professor of Mathematics Courses taught are Contemporary Mathematics (Liberal Arts course), Finite Mathematics, Business Calculus, Technical Mathematics, Mathematics for Elementary Teachers 1, Calculus 1, 2, & 3, Differential Equations, Linear Algebra, Abstract Algebra, Number Theory, and Topology.

Department of Mathematics/Computer Science
Bemidji State University

August 1998 – May 2001

Assistant Professor of Mathematics Courses taught are College Algebra, Algebra and Math Reasoning (a liberal arts course), Math for Elementary Teachers 2, first and second semester Calculus for business and biological science majors, Foundations and Discrete Mathematics (an introductory proof course), and Linear Algebra. I have also participated in the Summer Mathematics Institute, a summer workshop for elementary and middle school teachers funded by the Eisenhower foundation. Topics included geometry, data investigation, probability, and discrete math.

Publications

- At GVSU**
- D.B. Parker *Feedback matrices and the lights out game on directed graphs*. Submitted to Electron. J. Linear Algebra.
 - T.E. Dettling and D.B. Parker *The lights out game on directed graphs*, To appear in Involve.
 - L. Keough and D.B. Parker *An extremal problem for the neighborhood lights out game*, *Discussiones Mathematicae Graph Theory*, **44(3)** (2024), pp. 997-1021.
 - D.B. Parker and V. Zadorozhnyy *A group labeling version of the lights out game*, *Involve* **14** (2021), pp. 541-554.
 - D.B. Parker, *The lights out game on subdivided caterpillars*, *Ars Combinatoria* **136** (2018), pp. 347-356.
 - C.A. Cusack, S.P. Edwards, and D.B. Parker, *Multidesigns of complete graphs for graph-triples of order 6*, *Journal of Combinatorial Mathematics and Combinatorial Computing* **94** (2015), pp. 177–203.
 - D.B. Parker and R.F. Westhoff, *Convex invariants in multipartite tournaments*, *Australasian Journal of Combinatorics* **54** (2012), pp. 19–35.
- Previously**
- A. Giffen and D.B. Parker, *On generalizing the “lights out” game and a generalization of parity domination*, *Ars Combinatoria* **111** (2013), pp. 273–288.
 - D.B. Parker, R.F. Westhoff, and M.J. Wolf, *Two-path convexity and bipartite tournaments of small rank*, *Ars Combinatoria* **97** (2010), pp. 181–191.

D.B. Parker, R.F. Westhoff, and M.J. Wolf, *Convex independence and the structure of clone-free multipartite tournaments*, *Discussiones Mathematicae Graph Theory* **29** (2009), pp. 51–69.

D.B. Parker, R.F. Westhoff, and M.J. Wolf, *On two-path convexity in multipartite tournaments*, *European Journal of Combinatorics* **29** (2008), pp. 641–651.

A. Abueida, M. Daven, W.S. Diestelkamp, S.P. Edwards, and D.B. Parker, *Multidesigns for graph-triples of order 6*, *Congressus Numerantium* **183** (2006), pp. 139–160.

D.B. Parker, R.F. Westhoff, and M.J. Wolf, *Two-path convexity in clone-free regular multipartite tournaments*, *Australasian Journal of Combinatorics* **36** (2006), pp. 177–196.

A. Abueida, W.S. Diestelkamp, S.P. Edwards, and D.B. Parker, *Determining properties of a multipartite tournament from its lattice of convex subsets*, *Australasian J. Combinatorics*, **31** (2005), pp. 217–230.

D.B. Parker, *On the coradical filtration of pointed coalgebras*, *J. Algebra*, **255** (2002), pp. 121–134.

D.B. Parker, *$U(\mathfrak{g})$ -Galois extensions*, *Comm. Algebra*, **29** (2001), pp. 2859–2870.

D.B. Parker, *Forms of coalgebras and Hopf algebras*, *J. Algebra*, **239** (2001), pp. 1–34.

In Progress J. Edwards, S. Napier, and D.B. Parker *Winnability for the neighborhood lights out games on complete multipartite graphs*. Paper is being revised. Also waiting for contact with co-author to submit.

B. Castillo, J. Edwards C. Miller, and D.B. Parker *Winnability for the group labeling lights out games*. Paper is written. Looking for appropriate journal to submit.

D.B. Parker *Universally extremal graphs for the Neighborhood Lights Out game*. Trying to prove some observations from *An extremal problem for the neighborhood lights out game*.

Refereeing Involve: July 2017

American Mathematical Monthly: August 2013

Discrete Applied Mathematics: May 2007

Discrete Mathematics: January 2008, August 2009, June 2012.

Australasian Journal of Combinatorics: July 2010

Talks

GVSU

“The Lights Out Game on Upset Tournaments”, Midwest Graph Theory Conference, Wright State University, Dayton, OH September 2025

“Winning the Neighborhood Lights Out Game on Dense Graphs”, Midwest Graph Theory Conference, University of Detroit Mercy, Detroit, MI April 2019

“An Extremal Problem on the Lights Out Game”, Midwest Graph Theory Conference, Grand Valley State University, Allendale, MI October 2017

“Yet Another Version of the Lights Out Game”, Midwest Graph Theory Conference, Wright State University, Dayton, OH April 2016

“The Lights Out Game on Subdivided Caterpillars”, Midwest Graph Theory Conference, Indiana-Purdue University Fort Wayne, Fort Wayne, IN October 2014

“Multidesigns for Graph-Triples of Order 6”, Midwest Graph Theory Conference, Miami University, Oxford, OH April 2013

“Graph Decompositions: The Jigsaw Puzzles of Graph Theory”, Calvin College Colloquium, Grand Rapids, MI, November 2012; Hope College Colloquium, Holland, MI, October 2012

“Multidecompositions: Taking a Graph Apart and Putting it Back Together”, Mathematics Department Seminar, GVSU, Allendale, MI, September 2012

“The Generalized Lights Out Game on Graphs”, REU Seminar, Grand Valley State University, Allendale, MI, July 2011; Mathematics Colloquium, Hope College, Holland, MI, November 2011.

“Generalizing the ‘Lights Out’ Game”, Midwest Graph Theory Conference, Indiana-Purdue University, Fort Wayne, IN April 2011.

“Convexity and Independence in Directed Graphs”, Mathematics Department Seminar, GVSU, Allendale, MI, October 2010.

“Helly and Radon Independence Under 2-Path Convexity in Multipartite Tournaments”, Midwest Graph Theory Conference, University of Detroit Mercy, Detroit, MI, April 2010.

“Some Families of Mathematical Games”, Mathematics Colloquium, Hope College, Holland, MI, February 2010

“Mental Models in Mathematics Classes”, Teaching Seminar, Grand Valley State University, Allendale, MI, October 2009

Previously

“A Mathematician Takes the Actuarial Exam”, Mathematics Department Seminar, Grand Valley State University, Allendale, MI; Mathematics Colloquium, Hope College, Holland, MI, October 2008.

“On Generalizing the ‘Lights Out’ Game and a Generalization of Parity Domination”, Invited Speaker, AMS Sectional Meeting, Special Session, Western Michigan University, Kalamazoo, MI October 2008.

“Some Mathematical Games”, Mathematics Department Seminar, Grand Valley State University, Allendale, MI; Mathematics Colloquium, Hope College, Holland, MI, October 2007.

“Helly and Radon Independence in Clone-Free Multipartite Tournaments”, Contributed Paper Session, Joint Mathematics Meetings, New Orleans, LA, January 2007.

“Convex Independence in Multipartite Tournaments”, Discrete Mathematics Seminar, Wright State University, October 2006

“Group Theory and ‘Lights Out’ ”, MAA Mathfest, Knoxville, TN, , August 2006.

“Multidesigns for Graph-Triples of Order 6”, Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Florida Atlantic University, Boca Raton, FL, March 2006.

“Cycles in Bipartite Tournaments”, Contributed Paper Session, Joint Mathematics Meetings, San Antonio, TX, January 2006.

“Convex Invariants in Multipartite Tournaments”, Midwest Graph Theory Conference, Middle Tennessee State University, Murfreesboro, TN September 2005.

“Cycles and Convexity in Bipartite Tournaments”, University of Dayton Mathematics Colloquium, University of Dayton, September 2005.

“The Mathematics of Games”, Invited Speaker, University of Dayton High School Mathematics Competition, University of Dayton, March 2005

“The Classical Convexity Numbers in Two-Path Convexity”, Midwest Graph Theory Conference, Ball State University, Muncie, IN November 2004.

“Making Writing a Central Part of Mathematics Courses”, Invited Speaker, Ohio Project NExT, John Carroll University, Cleveland, OH October 2004.

“Two-Path Convexity in Multipartite Tournaments”, Midwest Graph Theory Conference, Western Kentucky University, Bowling Green, KY May 2004.

“Convexity in Graphs and Digraphs”, Invited Speaker, Wright State University Mathematics & Statistics Colloquium, April 2004.

“Determining Properties of a Multipartite Tournament from its Lattice of Convex subsets”, Invited Speaker, Joint Mathematics Meetings, Phoenix, AZ January 2004.

“Convexity in Multipartite Tournaments”, Miami University Mathematics & Statistics Conference, Miami University, Oxford, OH October 2003.

“On Recovering a Multipartite Tournament from its Lattice of Convex Subsets”, Midwest Graph Theory Conference, Valparaiso University, Valparaiso, IN September 2003.

“Convex Subset Lattices of Clone-Free Multipartite Tournaments”, Midwest Graph Theory Conference, University of Wisconsin, Oshkosh, May 2003.

“The Breadth of Convex Subset Lattices of Clone-Free Multipartite Tournaments”, Discrete Mathematics Seminar, Wright State University, May 2003.

“Some Upper Bounds on the Breadth of Convex Subset Lattices in Multipartite Tournaments”, Invited Speaker, AMS Sectional Meeting, Indiana University, Bloomington, IN April 2003.

“On the Coradical Filtration of Pointed Coalgebras”, Invited Speaker, AMS Sectional Meeting, University of Wisconsin, Madison, WI, October 2002.

“Convex Subsets of Multipartite Tournaments”, Discrete Mathematics Seminar, Wright State University, October, 2002.

“On the Breadth of Lattices of Convex Subsets in Multipartite Tournaments”, Midwest Graph Theory Conference, Illinois State University, Normal, IL, September 2002.

“On the Lattices of Convex Subsets in Multipartite Tournaments”, Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Florida Atlantic University, Boca Raton, FL, March 2002

“Group Learning in Mathematics”, Teaching Seminar, University of Dayton, October 2001.

“Convex Subsets of Tournaments”, Expository Seminar, University of Dayton, September, 2001.

“Mathematics as a Religion”, Honors Council Lecture Series, Bemidji State University, March, 2001.

“Descent Theory for Coalgebras and Hopf Algebras”, Expository Seminar, University of Dayton, February, 2001.

“Descent Theory for Duals of Inseparable Field Extensions”, Contributed Paper Session, Joint Mathematics Meetings, New Orleans, LA, January, 2001.

“Mathematics and Storytelling”, “Noon Meeting” Teaching Seminar, Bemidji State University, November, 2000.

“Using Mid-Term Evaluations as a Teaching Tool”, “Noon Meeting” Teaching Seminar, Bemidji State University, April, 2000.

“Coalgebras, Hopf Algebras, and Descent Theory”, Research Seminar, Bemidji State University, February, 1999 to April, 1999.

“Cooperative Learning in Calculus Courses”, “Noon Meeting” Teaching Seminar, Bemidji State University, September, 1998.

“Tensor Products and Comultiplication in Vector Spaces”, United States Air Force Academy, Colorado Springs, CO, March 1998.

“Forms of Hopf Algebras and $U(\mathfrak{g})$ -Galois extensions,” Contributed Paper Session, Joint Mathematics meetings, Baltimore, MD, January 1998.

“Forms of Coalgebras and Hopf Algebras,” Invited speaker, AMS Sectional Meeting, Milwaukee, WI, October 1997.

Service

- University** **University Curriculum Committee:** Evaluate proposals from units throughout GVSU, including new courses, course changes, and changes to programs. Read roughly 10–15 proposals per week, make comments on a Google document to facilitate discussion, and meet weekly for two hours to discuss and vote on proposals. *August 2022 to present.*
- CLAS** **CLAS Curriculum Committee:** Evaluate proposals from units in CLAS, including new courses, course changes, and changes to programs. Read roughly 6–11 proposals per week, make comments on a Blackboard Wiki to facilitate discussion, and meet weekly for two hours to discuss and vote on proposals. In Fall 2017, we processed over 800 Syllabi of Record in preparation for GVSU accreditation. Served as chair in Fall 2016, Fall 2017, and Winter 2018. *Fall 2012 to Winter 2018, and Fall 2019 to Winter 2022.*
- Unit** **CIS/Math Combined Degree Task Force:** Worked collaboratively with the College of Computing to develop a combined degree in computer science and mathematics. We developed the mathematics requirements for the combined degree and helped develop a new program prospectus with the College of Computing. *August to December 2025.*
- Assessment Committee:** Works on issues related to assessment (e.g. strategic planning) in the department. *August 2020 to present.*
- Diversity Advisory Committee:** Advises unit head on issues related to diversity and inclusion. *August 2009 to present.*
- Department Curriculum Committee:** Determined course equivalencies for students transferring from another institution; wrote and reviewed Syllabi of Record for mathematics courses in preparation for GVSU accreditation; facilitated the writing of curriculum proposals. *August 2009 to May 2012, August 2017 to May 2019, January to May 2023, and January to May 2024 (chaired committee from August 2010 to May 2011).*
- Non-Certification Emphases Task Force:** Looks at our theoretical mathematics and applied mathematics emphases to determine ways to make our major more effective and attractive to students. *August 2021 to May 2022.*
- Applied Mathematics Emphasis Task Force:** Developed an applied mathematics emphasis for the non-certification major. We studied other applied mathematics programs as well as the needs of our students and our curriculum. We coordinated with the Linear Algebra Task Force to include the new courses they were proposing. We also developed a modeling course and a capstone course for the emphasis. *August 2017 to May 2019.*
- Student Success and Advising Task Force:** This task force was created to help

foster both the creation and implementation of ideas that can help our students achieve greater success in our classes, help our faculty more effectively advise students, and find ways to recruit students into our majors. In Fall 2014, I worked on a group responsible for writing profiles of alumni to help with recruitment. In Winter 2015, I worked with Dr. David Clark, along with students from the Statistics Department, to develop and administer a study to help the department understand how MTH 202 affects retention and recruitment of mathematics majors. In Fall 2015, I started looking at the data for any patterns that may be helpful. *August 2014 to May 2016.*

Student Affairs Committee: Organize Alumni-in-Residence event, revise the advisee checklist, and award student memberships to professional mathematics societies. *August 2012 to May 2015. Chaired committee from August 2013 to May 2014.*

Task Force for Math 201/210 Credit Swap: Support proposal for changing the number of credits for Math 201 and Math 210. Attended meetings and helped identify client disciplines that would be impacted by the change. *August 2010 to May 2011.*

GVSU Mathematical Problem Solving Club: Along with Clark Wells and others, provide activities, instruction, and collegiality for helping students pursue interesting mathematics problems and participate in mathematics competitions.
August 2009 to May 2014.

Community **National Science Foundation Review Panel:** Reviewed proposals for grants for the NSF program Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM). September 2010. *Grand Valley State University*

Previously **Putnam/GRE Study Session:** Ran study session for students competing in Putnam exam (Fall) and taking Mathematics GRE (Spring). Fall 2004 to Fall 2006
University of Dayton

Colloquium Committee: Maintained web pages, invited speakers, and took care of logistics for visiting speakers. Winter 2004 to Fall 2006 *University of Dayton*

Curriculum Committees: Helped to write department syllabi; helped to create a new discrete mathematics course for math majors and re-organize the probability/statistics sequence. Fall 2003 to Winter 2005 *University of Dayton*

Integration Bee: Devised and typed integrals for the competition, acted as official timekeeper, along with other miscellaneous tasks. Winter 2005 to Winter 2006
University of Dayton

Academic Senate: Participated in discussions about changes in general education and discipline-specific curricula. Fall 2006 to Winter 2007 *University of Dayton*

Calculus Textbook Selection Committee: Fall 2004 University of Dayton

Ohio Section MAA Committee: Committee on curriculum. Fall 2006 to Winter 2007

Research Seminar Co-Organizer: Helped organize and gave talks in a seminar designed to increase faculty interest and participation in research activities. Fall 1999 to Fall 2000
Bemidji State University

Northern Minnesota Mathematics Contest Exam Co-Writer: Fall 1999
Bemidji State University

Conferences Midwest Graph Theory Conference, Wright State University, September 2025

FTLC Fall Teaching Conference, GVSU, August 2025

FTLC Fall Teaching Conference, GVSU, August 2023

FTLC Fall Teaching Conference, GVSU, August 2022

Midwest Graph Theory Conference, University of Detroit Mercy, April 2019

Midwest Graph Theory Conference, GVSU, October 2017

FTLC Fall Teaching Conference, GVSU, August 2016

Midwest Graph Theory Conference, Wright State University, April 2016

FTLC Fall Teaching Conference, GVSU, August 2015

Midwest Graph Theory Conference, Indiana-Purdue University Fort Wayne, October 2014

FTLC Fall Teaching Conference, GVSU, August 2014

FTLC Fall Teaching Conference, GVSU, August 2013

Midwest Graph Theory Conference, Miami University, April 2013

Joint Mathematics Meetings, San Diego, CA, January 2013

FTLC Fall Teaching Conference, GVSU, August 2012

Mathfest, Madison, WI, August 2012

Michigan Section of the MAA, Saginaw Valley State University, May 2012

FTLC Fall Teaching Conference, GVSU, August 2011

Michigan Section of the MAA, Western Michigan University, May 2011

Midwest Graph Theory Conference, Indiana-Purdue University at Fort Wayne, April 2011

FTLC Fall Teaching Conference, GVSU, August 2010

Mathfest, Pittsburgh, PA, August 2010

Michigan Section of the MAA, Eastern Michigan University, May 2010

- Midwest Graph Theory Conference, University of Detroit Mercy, April 2010
- FTLC Fall Teaching Conference, GVSU, August 2009
- Michigan Section of the MAA, Central Michigan University, May 2009
- AMS Central Sectional Meeting, Western Michigan University, October 2008
- FTLC Fall Teaching Conference, GVSU, August 2008
- Michigan Section of the MAA, Grand Valley State University, May 2008
- Michigan Undergraduate Mathematics Conference, Michigan State University, October 2007
- Midwest Graph Theory Conference, University of Detroit Mercy, October 2007
- FTLC Fall Teaching Conference, GVSU, August 2007
- Midwest Graph Theory Conference, Wright State University, May 2007
- Joint Mathematics Meetings, January 2007
- Midwest Graph Theory Conference, Indiana-Purdue University at Fort Wayne, November 2006
- Mathfest, August 2006
- Ohio Section of the MAA, Shawnee State University, April 2007
- AMS Central Sectional Meeting, Miami University, March 2007
- Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Florida Atlantic University, March 2006
- Joint Mathematics Meetings, January 2006
- Undergraduate Mathematics Day, University of Dayton, November 2005
- Ohio Section of the MAA, Muskingum College, October 2006
- Ohio Section of the MAA, Ashland University, October 2005
- Midwest Graph Theory Conference, Middle Tennessee State University, September 2005
- Ohio Section of the MAA, Miami University, April 2005
- Midwest Graph Theory Conference, Ball State University, November 2004.
- Ohio Section of the MAA, John Carroll University, October 2004.
- Midwest Graph Theory Conference, Western Kentucky University, May 2004
- Joint Mathematics Meetings, January 2004.

Miami University Mathematics & Statistics Conference, Miami University, October 2003.

Midwest Graph Theory Conference, Valparaiso University, September 2003.

Midwest Graph Theory Conference, University of Wisconsin, Oshkosh, May 2003

AMS Central Sectional Meeting, Indiana University, April 2003

Ohio Section of the MAA, Kent State University, Trumbull, October 2002

AMS Central Sectional Meeting, University of Wisconsin, Madison, October 2002

Midwest Graph Theory Conference, Illinois State University, September 2002

Ohio Section of the MAA, Xavier University, April 2002

Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Florida Atlantic University, March 2002

Ohio Section of the MAA, Marietta College, October 2001

North Central Section of the MAA, Bemidji State University, MN, October 2000

Wisconsin/Minnesota Project NExT workshop on the History of Mathematics, led by Dr. Fred Rickey, Menomonie, WI, September 2000

MAA North Central Section, Duluth, MN, April 2000

AMS Joint Mathematics Meetings, Washington, D.C., Jan 2000

Wisconsin/Minnesota Project NExT workshop on Research in Mathematics Education, led by Dr. Ed Dubinsky, Menomonie, WI, October 1999

MAA North Central Section, University of Minnesota, Morris, MN, October 1999

MAA North Central Section, Carleton College, Northfield, MN, April 1999

AMS Joint Mathematics Meetings, San Antonio, TX, January 1999

MAA North Central Section, Concordia College, Moorhead, MN, October 1998

AMS Joint Mathematics Meetings, Baltimore, MD, January 1998

AMS Fall Central Sectional Meeting, Milwaukee, WI, October 1997

AMS Joint Mathematics Meetings, San Diego, CA, January 1997