

Erik Westlund

Curriculum Vitae

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Academic Positions

- 2017 **Associate Professor**, *Kennesaw State University*, Kennesaw.
Department of Mathematics
- 2011 **Assistant Professor**, *Kennesaw State University*, Kennesaw.
Department of Mathematics
- 2010 **Assistant Professor**, *University of Wisconsin–Marshfield/Wood Co.*, Marshfield.
Department of Mathematics
- 2004 **Graduate Teaching Assistant**, *Michigan Technological University*, Houghton.
Department of Mathematical Sciences

Education

- 2010 **Ph.D., Mathematical Sciences**, *Michigan Technological University*, Houghton.
- 2006 **M.S., Mathematics**, *Michigan Technological University*, Houghton.
- 2003 **B.S., Mathematics**, *Northland College*, Ashland.

Research Interests

Discrete mathematics (combinatorics, extremal graph theory, and algebraic graph theory) and undergraduate mathematics education.

Research Activities

Refereed Journal Articles

- 2022 Vandenbussche, J., and Westlund, E. E., Matching extendability in Cartesian products of cycles, *Australasian Journal of Combinatorics*, **82**(3), 317–334.
- 2021 Vandenbussche, J., Ritter, L., Callahan, K., and Westlund, E. E., Using strand committees to build faculty support for departmental change, *PRIMUS: Problems, Resources, and Issues in Mathematics Undergraduate Studies*, **31**(3–5), 330–342.
- 2020 Larsen, V., Vandenbussche, J., and Westlund, E. E., Hall spectra and extending precolorings with extra colors, *Australasian Journal of Combinatorics*, **76**(3), 346–365.
- 2016 Holliday, S., Vandenbussche, J., and Westlund, E. E., Every graph G is Hall $\Delta(G)$ -extendible, *Electronic Journal of Combinatorics*, **23**(4), #P4.19.
- 2016 Golubski, A. J., Westlund, E. E., Vandermeer, J., and Pascual, M., Ecological networks over the edge: hypergraph trait-mediated indirect interaction (TMII) structure. *Trends in Ecology and Evolution*, **31**(5), 344–354.
- 2015 Holliday, S., Vandenbussche, J., and Westlund, E. E., Completing partial proper colorings using Hall’s condition, *Electronic Journal of Combinatorics*, **22**(3), #P3.6.

- 2015 Castle, M., Moore, E. D., and Westlund, E. E., Directed tree decompositions of Cayley digraphs with word-degenerate connection sets, *Australasian Journal of Combinatorics*, **61**(1), 82–97.
- 2014 Westlund, E. E., Hamilton decompositions of 6-regular Cayley graphs on even abelian groups with involution-free connection sets, *Discrete Mathematics*, **331**, 117–132.
- 2012 Westlund, E. E., Hamilton decompositions of certain 6-regular Cayley graphs on abelian groups with a cyclic subgroup of index two. *Discrete Mathematics*, **312**, 3228–3235.
- 2010 Kreher, D. L., and Westlund, E. E., n-isofactorizations of 8-regular circulant graphs. *Journal of Combinatorial Mathematics and Combinatorial Computing*, **72**, 197–209.
- 2009 Westlund, E. E., Liu J., and Kreher, D. L., 6-Regular Cayley graphs on abelian groups of odd order are Hamiltonian decomposable. *Discrete Mathematics*, **309**, 5106–5110.

Current Research Projects

- 2021+ Vandenbussche, J., and Westlund, E. E., Matching extendability in bipartite Cayley graphs, manuscript in preparation
- 2022+ Ritter, L., and Westlund, E. E., Targeted vocabulary study in mathematics

Grants and Fellowships

Funded External Grant Proposals

- 2018–2020 **Student Engagement in Mathematics through an Institutional Network for Active Learning**, *SEMINAL (Phase 2)*, National Science Foundation.
PI Jennifer Vandenbussche, CoPIs Kadian M. Callahan, Lake Ritter, Erik Westlund (\$93,249)

Funded Internal Grant Proposals

- 2017-2018 **Learning-Centered Course Redesign of Calculus 1**, *Gateways to Completion: Course Redesign Faculty Learning Community*, Kennesaw State University.
PI Erik Westlund (\$4,000)
- 2016 **Cluster Detection, Subgraphs, Hyperpaths in Ecological Hypergraphs**, *Office of the Vice President for Research (OVPR) Award*, Kennesaw State University.
PI Erik Westlund, CoPI Antonio Golubski (\$5,700)
- 2015–2016 **Interval Edge Colorings of Cayley Graphs**, *Mentor-Protégé Award*, Kennesaw State University.
PI Erik Westlund, CoPI Stephen Dong (undergraduate student) (\$1,684)
- 2013–2015 **Interactive effects in networks across diverse disciplines**, *Interdisciplinary Research Opportunities Program (IDROP) Award*, Kennesaw State University.
CoPIs Antonio Golubski, Erik Westlund, and Jing He (\$75,000)
- 2011 **Hamilton Decompositions of Cayley Graphs**, *Faculty Summer Research Award*, Kennesaw State University.
PI Erik Westlund (\$5,300)

Travel Grants

- 2022–2024 **Structural Properties of Cayley graphs**, *Bilateral Scientific Research Cooperation Between RS and USA*, Slovenian Research Agency.
Slovenian Lead: Ademir Hujdurović, USA Lead: Erik Westlund (€3,000)
- 2018–2020 **Structural Properties of Cayley graphs**, *Bilateral Scientific Research Cooperation Between RS and USA*, Slovenian Research Agency.
Slovenian Lead: Ademir Hujdurović, USA Lead: Erik Westlund (€3,000)

- 2016 **Kennesaw State University (Center for Excellence in Teaching and Learning)**, *Undergraduate Research & Creative Activity (URCA) Award*.
Travel support for undergraduate student to present research. (\$500)
- 2014 **Kennesaw State University (Center for Excellence in Teaching and Learning)**, *Undergraduate Research & Creative Activity (URCA) Award*.
Travel support for undergraduate student to present research. (\$325)
- 2013 **Kennesaw State University**, *Faculty Travel Award*.
Ph.D. Summer School in Discrete Mathematics, Slovenia (\$3,700)
- 2012 **Kennesaw State University (Center for Excellence in Teaching and Learning)**, *Faculty Travel Award*.
AMS/MAA Joint Mathematics Meetings (\$300)
- 2012 **Kennesaw State University (Center for Excellence in Teaching and Learning)**, *Faculty Travel Award*.
AMS Fall Eastern Sectional Meeting (\$300)
- Fellowships
- 2011–2012 **Sponsor: John C. Wiley & Sons, Inc.**, *Project NExT (New Experiences in Teaching)*,
Mathematical Association of America.

Professional Memberships

Institute of Combinatorics and its Applications, Associate Fellow

Selected Presentations

Invited Talks

- 03/2022 TBA, Special Session on Recent Advances in Graph Theory and Combinatorics, Spring Southeastern Sectional Meeting of AMS, University of Virginia, Virginia (conference canceled)
- 03/15/2020 "Extending Matchings to Perfect Matchings in Cartesian Products of Even Cycles," Special Session on Recent Advances in Graph Theory and Combinatorics, Spring Southeastern Sectional Meeting of AMS, University of Virginia, Virginia (conference canceled)
- 02/15/2015 "Precoloring Extensions using Hall's Condition," The 14th Atlanta Lecture Series in Combinatorics and Graph Theory, Georgia State University, Atlanta
- 10/03/2013 "The Elusive Hamilton Problem for Cayley Graphs—An Overview," The 28th Clemson mini-Conference on Discrete Mathematics and Algorithms, Clemson University, Clemson
- 03/18/2013 "The Ubiquity of Graphs: How Set Systems Are Enriching Our World," Mathematics Department Colloquium, Berry College, Mount Berry
- 11/10/2012 "Hamilton Decompositions of Cayley graphs on Abelian Groups," Workshop on Group Actions on Graphs, Mississippi State University, Starkville
- 09/23/2012 "Alspach's Conjecture: Hamilton Decompositions of Certain 6-Regular Cayley Graphs on Abelian Groups of Even Order," Special Session on New Advances in Graph Theory, AMS Fall Eastern Sectional Meeting, Rochester Institute of Technology, Rochester
- 02/23/2010 "The Lovász Conjecture and Hamiltonian Cycle Decompositions," Mathematics and Statistics Department Colloquium, Kennesaw State University, Kennesaw

Contributed Talks & Posters

- 07/23/2021 "Extendability of k -Suitable Matchings in Cartesian Products," SIAM Conference on Discrete Mathematics, Virtual Conference

- 10/12/2018 "Implementing Mastery Grading in Undergraduate Mathematics," 2018 Research on Teaching and Learning (ROTL) Summit, Kennesaw State University, Kennesaw
- 03/06/2017 "The Hall spectrum of a graph can have non-consecutive zeros," 48th Southeastern International Conference on Combinatorics, Graph Theory and Computing, Florida Atlantic University, Boca Raton
- 06/07/2016 "Precoloring Extensions Using a Generalization of Hall's Marriage Theorem," SIAM Conference on Discrete Mathematics, Georgia State University, Atlanta
- 01/06/2016 "Hypergraphs in Ecological Network Analysis," AMS/MAA Joint Mathematics Meetings, Seattle
- 01/12/2015 "All Graphs are Hall $\Delta(G)$ -Completable," AMS/MAA Joint Mathematics Meetings, San Antonio
- 11/15/2014 "Decomposing Cayley digraphs into isomorphic directed trees", 3rd Annual Mississippi Discrete Mathematics Workshop, Mississippi State University, Starkville
- 05/16/2014 "Directed Tree Decompositions of Cayley Digraphs," 27th Cumberland Conference on Combinatorics, Graph Theory & Computing, West Virginia University, Morgantown
- 03/07/2014 "Bipartite Planar Graphs are Hall $\Delta(G)$ -Completable," 45th Southeastern International Conference on Combinatorics, Graph Theory and Computing, Florida Atlantic University, Boca Raton
- 01/06/2012 "Some Planar Hall Completable Graphs," AMS/MAA Joint Mathematics Meetings, Boston
- 01/06/2011 "Hall m -Completable Graphs," AMS/MAA Joint Mathematics Meetings, New Orleans
- 10/23/2010 "Hall's Condition and Partial Proper m -Colorings," 50th Midwest Graph Theory (MIGHTY L), University of Wisconsin, Superior
- 01/16/2010 "The Hamiltonian Decomposition Problem for Cayley Graphs on Abelian Groups, AMS/MAA Joint Mathematics Meetings, San Francisco
- 03/29/2009 "Hamiltonian Cycle Decompositions of 6-Regular Cayley Graphs on Finite Abelian Groups," 5th Graduate Student Combinatorics Conference, University of Kentucky Lexington
- Campus Seminar Talks
- 02/19/2021 "Extendability of k -suitable matchings in Cartesian products," Discrete Mathematics Seminar, Kennesaw State University, Kennesaw
- 11/09/2018 "Active Learning Techniques," Teaching Conversations Seminar, Joint Presentation with Lake Ritter and Jennifer Vandebussche, Kennesaw State University, Kennesaw
- 05/04/2018 "MATH 1190 Calculus 1 Course Redesign," Teaching Conversations Seminar, Kennesaw State University, Kennesaw
- 02/14/2017 "Connecting the Dots: Graph Theory in Complex Network Analysis," CSM Seminar, Kennesaw State University, Kennesaw
- 03/10/2016 "Hypergraphs in Ecological Network Analysis," Discrete Mathematics Seminar, Kennesaw State University, Kennesaw
- 04/09/2014 "Directed Tree Decompositions of Cayley Digraphs with Word-Degenerate Connection Sets," Algebra, Number Theory, and Discrete Mathematics (AND) Seminar, Kennesaw State University, Kennesaw
- 09/25/2013 "The Elusive Hamilton Problem for Cayley Graphs," Algebra, Number Theory, and Discrete Mathematics (AND) Seminar, Kennesaw State University, Kennesaw
- 09/19/2013 "Research Opportunities at KSU and Beyond," Panel Session, MathTALKS Seminar, Kennesaw State University, Kennesaw
- 01/24/2013 "Mathematics Research Panel," Panel Session, MathTALKS Seminar, Kennesaw State University, Kennesaw

- 03/15/2012 "Graphics and Bibliographies with L^AT_EX," MathTALKS Seminar, Kennesaw State University, Kennesaw
- 02/16/2012 "Introduction to the Language of L^AT_EX," MathTALKS Seminar, Kennesaw State University, Kennesaw
- 11/10/2011 "Chromatic Completability: Using the Marriage Theorem to Color Graphs," ScienceTALK Seminar, Kennesaw State University, Kennesaw

Teaching & Mentoring

All of the following courses had full instructor responsibilities.

Kennesaw State University

Course	# 15-Week Sections	# 8-Week Sections
MATH 8020 Graph Theory	2	
MATH 7712 Discrete Mathematics		1
MATH 4362 Modern Algebra II	1	
MATH 4361 Modern Algebra I	9	4
MATH 3324 Enumerative Combinatorics	1	
MATH 3322 Graph Theory	3	
MATH 3260 Linear Algebra I	2	
MATH 2390 Logic, Set Theory, and Proofs	1	
MATH 2345 Discrete Mathematics	21	9
MATH 2202 Calculus II	1	1
MATH 1190 Calculus I	9*	2

*Majority were double-sections with 60 enrolled.

University of Wisconsin–Marshfield/Wood County

- Calculus I
- Mathematics for Elementary Teachers
- Pre-Calculus Mathematics
- Elementary Statistics
- College Algebra

Michigan Technological University

- Elementary Differential Equations (online)
- Introduction to Combinatorics
- Elementary Linear Algebra
- Calculus with Technology II
- Calculus with Technology I
- Calculus for Life Sciences

Student Mentoring Activities

2017–2021 **Supervisor**, *Learning Assistant Program*.

Supervised four undergraduate students employed as Learning Assistants for MATH 1190 Calculus 1 during Fall 2017, Spring 2018, and Fall 2018 and MATH 2345 Discrete Mathematics during Fall 2021. This involved working closely with the students to prepare for assisting with the implementation of active learning pedagogy in my classes.

- 2015–2016 **Interval Edge Colorings of Cayley Graphs on Finite Groups**, *Undergraduate Research Project*.
Developed and supervised an undergraduate research experience culminating in a student oral presentation at one national conference and one campus-wide symposium. The experience was separated across two sections of MATH 4699: Undergraduate Research.
- 2013–2014 **Tree Decompositions of Cayley Graphs and Digraphs with Word-Degenerate Connection Sets**, *Undergraduate Research Project*.
Developed and supervised an undergraduate research experience culminating in a research manuscript published in a peer-reviewed journal and student oral presentation at three external conferences, one internal conference, one campus-wide symposium, and one department seminar. The experience was separated across two courses: MATH 4699: Undergraduate Research, MATH 4700: Capstone Experience
- 2014 **The Sylow Theorems**, *Honors Project Supervision*.
Developed and supervised a standard Honors contract in a non-Honors course focusing on the Sylow theorems in Modern Algebra I.
- 2013 **Combinatorial Design Theory**, *Honors Project Supervision*.
Developed and supervised a standard Honors contract in a non-Honors course focusing on combinatorial block designs in Discrete Mathematics I.

Service

Service at Kennesaw State University

- 2021-present **Member**, *College of Science and Mathematics Task Force for Teaching Assessment and Recognition*.
- 2020–present **Member**, *Department Promotion and Tenure Committee*.
2017–2019 **Chair (2018–2019), Member (2017–2018)**, *Department Faculty Council*.
- 2021–present **Co-Chair**, *Course Strand Committee (Lower-Division Calculus)*.
2019–2020 **Course Coordinator**, *Calculus 1*.
Duties include maintaining a repository of course materials and active learning materials, design and maintain an online homework template in MyLab Math, holding instructor meetings, facilitating peer observation process for instructors
- 2013–2021 **Co-organizer**, *Discrete Mathematics Seminar (DMS)*.
- 2018–2019 **Faculty Mentor**, *College of Science and Mathematics Mentoring Program*.
2018 **Member**, *Ph.D. Analytics & Data Science Curriculum and Admissions Committee*.
- 2017–2019 **Member**, *Ph.D. Dissertation Committee*, *Ph.D. Analytics & Data Science Program*.
- 2017–2018 **Member**, *Department Chair Search Committee*.
Chair (2015–2016), Member (2014–2015), Member (2019–2020), *Faculty Search Committees*.
- 2015–2016 **Member (external)**, *M.S. Thesis Committee*, *Master of Science in Integrative Biology Program*.

Service to the Profession

Selected Journals and Databases, Refereeing & Reviewing.

Australasian Journal of Combinatorics, Discrete Mathematics, Journal of Combinatorial Designs, Journal of Graph Theory, Mathematical Reviews (American Mathematical Society), PRIMUS (Problems, Resources, and Issues in Mathematics Undergraduate Studies), Theory and Applications of Graphs

- 2012 **Co-organizer**, *Project NExT Panel Session, AMS/MAA Joint Mathematics Meetings*.

Service and Activities at Other Institutions

- 2011 **Member**, *Student Leadership Selection Committee*, Department of Mathematics, University of Wisconsin-Marshfield/Wood County.
- 2011 **Member**, *High School Math League Competition Committee*, Department of Mathematics, University of Wisconsin-Marshfield/Wood County.
- 2009 **Co-organizer**, *Combinatorics, Algebra, and Number Theory Seminar*, Department of Mathematical Sciences, Michigan Technological University.
- 2009 **Department of Mathematical Sciences, Michigan Technological University**, *Common Exam Question Bank*.
Contracted by department to develop a L^AT_EX database of exam questions, solutions, and templates to be used by multiple-section courses in first and second-semester calculus.
- 2009 **Department of Mathematical Sciences, Michigan Technological University**, *Calculus 2 Course Coordinator*.
Duties include organizing and leading instructor meetings for the twelve-section course, Calculus with Technology II; responsible for designing, keying, and providing a detailed grading rubric for the common Final Exam; overseeing/ensuring uniformity in the common grading of the Final Exam.
- 2009 **Department of Mathematical Sciences, Michigan Technological University**, *Grader for Ph.D.-level Course*.
Duties include preparing solution key and grading papers for Topics in Commutative Algebra
- 2008 **Department of Mathematical Sciences, Michigan Technological University**, *Calculus 2 Mathematica Lab Course Coordinator*.
Duties include collaborating with faculty in the design and implementation of *Mathematica* lab worksheets and *Blackboard* quizzes for all sections of Calculus with Technology II.

Professional Development

- 2018 Student Success Initiative: Faculty Learning Community, "Active Learning in Calculus 1 and 2," College of Science and Mathematics, Kennesaw State University
- 2017–2018 Gateways To Completion: Faculty Learning Community, "Course Redesign Institute," Center for Excellence in Teaching and Learning, Kennesaw State University
- 2013 PhD Summer School in Discrete Mathematics, University of Primorska and University of Ljubljana, Slovenia
- 2012 Project NExT Mini-Course, "Using Inquiry to Teach Mathematics and Thinking," MAA Math-Fest
- 2012 MAA Mini-Course, "Getting Students Involved in Undergraduate Research," AMS/MAA Joint Mathematics Meetings
- 2008 IMA-PI Summer Program for Graduate Students: "Linear Algebra and its Applications", Institute for Mathematics and Its Applications, Iowa State University, Ames
- 2007 IMA-PI Summer Program for Graduate Students: "Applicable Algebraic Geometry", Institute for Mathematics and Its Applications, Texas A&M University, College Station