

Christina M. Graves

Curriculum Vitae (updated 2023)

The University of Texas at Tyler
Department of Mathematics
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Education

Ph.D. in Mathematics	2009
<i>Syracuse University, Syracuse, NY</i>	
- Advisor: Jack Graver	
- Certificate in University Teaching	
Master of Science in Mathematics	2005
<i>Syracuse University, Syracuse, NY</i>	
Bachelor of Science in Mathematics and Computer Science	2002
<i>Eastern Illinois University, Charleston, IL</i>	
- Summa Cum Laude	
- University Honors and Departmental Honors	

Employment

Distinguished Teaching Professor, <i>The University of Texas at Tyler</i>	2023–present
Professor, <i>The University of Texas at Tyler</i>	2018–2023
Associate Professor, <i>The University of Texas at Tyler</i>	2015–2018
Assistant Professor, <i>The University of Texas at Tyler</i>	2009–2015
Teaching Assistant, <i>Syracuse University</i>	2003–2009

Honors

UT Tyler Distinguished Faculty Fellow	
UT Tyler Academy of Distinguished Teachers Founding Fellow	
UT Tyler Inaugural Faculty Fellow in Undergraduate Research	2013–2017

Awards

President's Scholarly Achievement Award	2023
Awarded \$2,500 by <i>The University of Texas at Tyler</i>	
Excellence in Teaching & Innovation: Level Two Certificate	2016
Awarded \$2,500 by <i>The University of Texas at Tyler</i>	
Excellence in Teaching & Innovation: Level One Certificate	2015
Awarded \$1,500 by <i>The University of Texas at Tyler</i>	
Regents' Outstanding Teaching Award	2014
Awarded \$25,000 by <i>The University of Texas System</i>	
Research Award	2013–2014
Awarded by the Office of Research and Technology Transfer at <i>The University of Texas at Tyler</i>	
UT Tyler Faculty Fellow	2013–2016
Awarded \$25,000 by <i>The University of Texas at Tyler</i>	
White Fellowship for Teaching Excellence	2012
Awarded \$2,500 by <i>The University of Texas at Tyler</i>	
Donald E. Kibbey Prize in Mathematics	2009
Awarded \$1,500 by <i>Syracuse University Mathematics Department</i>	

Publications

1. Fixing numbers of graphs with symmetric and generalized quaternion symmetry groups, *Graphs and Combinatorics* **40**, 14 (2024). DOI: 10.1007/s00373-023-02742-9.
2. More reliable graphs are not always stronger, *Networks*, **81** (2023), 490–498. DOI: 10.1002/net22141
3. A new statistic on Dyck paths for counting 3-dimensional Catalan words, *Discrete Mathematics*, **346** (3) (2023). DOI: 10.1016/j.disc.2002.113247
4. Pattern restricted permutations composed of 3-cycles, with K. Archer, *Discrete Mathematics*, **345** (7) (2022). DOI: 10.1016/j.disc.2022.112895
5. Most reliable two-terminal graphs with node failures, with I. Brown*, B. Miller*, and T. Russell*, *Networks* (2020). DOI: 10.1002/net.21968
6. Network reliability: heading out on the highway, with J. Brown, C. Colbourn, D. Cox, and L. Mol, *Networks* (2020). DOI: 10.1002/net.21977
7. Counting acyclic and strong digraphs by descents, with K. Archer, I. Gessel, and X. Liang*, *Discrete Mathematics*, **343**(11) (2020). DOI: 10.1016/j.disc.2020.112041
8. Classes of uniformly most reliable graphs for all-terminal reliability, with K. Archer and D. Milan, *Discrete Applied Mathematics* **267** (2019), 12–29.
9. Vertex-minimal graphs with dihedral symmetry II, with L.-K. Lauderdale, *Discrete Mathematics* **342** (2019), 1378–1391. DOI 10.1016/j.disc.2018.12.028
10. On uniformly most reliable two-terminal graphs, with H. Bertrand*, O. Goff*, and M. Sun*, *Networks* **72** (2018); 200–216. DOI:10.1002/net.21811
11. Smallest graphs with given generalized quaternion automorphism group, with S. Graves and L.-K. Lauderdale, *Journal of Graph Theory* **87** (2018), 430–442. DOI: 10.1002/jgt.22166
12. Vertex-minimal graphs with dihedral symmetry, with S. Graves and L.-K. Lauderdale, *Discrete Mathematics* **340** (2017), 2573–2588. DOI: 10.1016/j.disc.2017.06.019
13. Extending patches to fullerenes, with J. McCloud-Mann and K. Stagg, *Ars Mathematica Contemporanea* **9** (2015), 219-232.
14. Fullerene patches II, with J. Graver and S. Graves, *Ars Mathematica Contemporanea* **7** (2014), 405-421.
15. Reliability polynomials with arbitrarily many inflection points, with D. Milan, *Networks* **64**(1) (2014), 1–5. DOI: 10.1002/net.21551
16. Counting symmetric and near-symmetric fullerene patches, with S. Graves, *Journal of Mathematical Chemistry* **52** (2014), 2423–2441. DOI:10.1007/s10910-014-0393-2
17. Side lengths of pseudoconvex fullerene patches, with J. McCloud-Mann, *Ars Mathematica Contemporanea* **5** (2012), 291-302.
18. Non-recursively constructible recursive families of graphs, with C. Bouey*, A. Ostrander* and G. Palma*, *The Electronic Journal of Combinatorics* **19**(2) (2012), #P9.

19. Inflection points of coherent reliability polynomials, *Australasian Journal of Combinatorics* **49** (2011), 111-126.
20. Fullerene patches I, with J. Graver, *Ars Mathematica Contemporanea* **3** (2010), 104-120.

* denotes undergraduate co-authors

Grant Experience

NSF Research Experience for Undergraduates (Co-PI)	2022–2024
Awarded \$311,154 to host a REU at UT Tyler for three summers	
Awarded an additional \$64,520 from UT Tyler to support the program	
NSF Research Experience for Undergraduates (Co-PI)	2017–2019
Awarded \$254,443 to host a REU at UT Tyler for three summers	
Awarded an additional \$56,906 from UT Tyler to support the program	
NSF Research Experience for Undergraduates (Co-PI)	2014–2016
Awarded \$258,739 to host a REU at UT Tyler for three summers	
Sonia Kovalevsky High School Mathematics Day Grant (PI)	2011
Awarded a conference grant of \$1,230 funded by the Association for Women in Mathematics	
The University of Texas at Tyler Faculty Research Grant (PI)	2011
Awarded a grant of \$4,000 to work on “Ambiguous Fullerene Patches”	
NSF Research Experience for Undergraduates (Senior Personnel)	2011
Supervised and assisted a group of 3 students in undergraduate research	

Mentoring

Senior Capstone Projects

B. Cook, “Latin Squares and Sudokus”	2022
D. du Preez, “Most Reliable Graphs with 8 vertices and 21 edges”	2021
A. Delgado, “Coloring Symmetric Shapes”	2019
K. McDaniel, “Ramsey Numbers”	2016
J. Benton, “Game Theory and the Prisoner’s Dilemma”	2015
T. Arnold, “Dots-and-Boxes”	2014
L. Thomas, “A Generalized Currency System”	2014
K. Prince, “Generalizing Optimization Problems”	2013
L. Edwards, “Counting Magic Squares”	2012
B. Williamson, “The Lottery Problem”	2012
L. Yankie, “Efficient Two-Coin System”	2010
M. Field, “Algebraic Graph Theory: Hamiltonian Paths”	2010

Research Experience for Undergraduates Mentor

L. Barksdale, M. MacDonald, and R. Maleki, “Two-terminal reliability and N -vector behavior”	2022
I. Brown, B. Miller, and T. Russell, “Most reliable two-terminal graphs with node failures”	2019
E. Liang, M. Martinez, and V. Osterman, “Inversions in directed acyclic graphs”	2018
A. Howard, C. Lewis, and K. Short, “Two-terminal reliability of graphs with terminal distance 3 or 4”	2017
H. Bertrand, O. Goff, and M. Sun, “Non-existence of uniformly most optimal 2-terminal graphs”	2016
K. Flanagan, B. Molokach, and R. Olugbemi, “Extending 5-Spirals to Fullerenes”	2015
C. Cornelus, J. Erickson, and H. Goetz, “Reliability of Recursively Constructed Graphs”	2014
C. Bouey, A. Ostrander, and G. Palma, “A Counterexample of a Conjecture of Noy and Ribo”	2011

Master's Thesis Advisor

M. Field, "Survey of Line Graphs and Hamiltonian Cycles" 2011–2012

Master's Thesis Committee Member

J. Woodruff, "Vertex minimal graphs with given automorphism group" 2016

A. Chick, "Behavior of Petrie lines in certain edge-transitive infinite graphs" 2017

MAA Project NExT Consultant

Teaching mentor for new math hires in Texas 2017–2018

Conference Research Presentations

- Pattern avoidance in one-line and cycle form (with K. Archer, et al)
AMS Eastern Sectional Meeting, 2024
- Catalan words and 321-avoiding permutations (with K. Archer)
AMS Southeastern Sectional Meeting, Chattanooga, TN 2022
- A new statistic on Dyck paths (with K. Archer)
Joint Mathematics Meetings (virtual) 2022
- Pattern-restricted permutations composed of only 3-cycles (with K. Archer)
Texas A&M Combinatorics and Algebra Seminar, College Station, TX 2020
AMS Southeastern Section Meeting, University of Florida, FL 2019
- Uniformly most reliable two-terminal networks
CombinaTexas 2019 Meeting, College Station, TX 2019
Texas Christian University Colloquium, Fort Worth, TX 2018
- Vertex Minimal Graphs with Dihedral Symmetry (with S. Graves and L.-K. Lauderdale)
Joint Meetings of the AMS and MAA, Atlanta, GA 2017
CombinaTexas 2016 Meeting, College Station, TX 2016
- Smallest Graphs with Given Automorphism Group (with S. Graves and L.K.-Lauderdale)
AMS Spring Western Section Meeting, Salt Lake City, UT 2016
- Smallest Graphs with Quaternion Automorphism Group (with S. Graves and L.-K. Lauderdale)
Texas Section MAA Conference, San Antonio, TX 2015
- Reliability Polynomials with Arbitrarily Many Inflection Points (with D. Milan)
MathFest, Portland, OR 2014
- Extending Patches to Fullerenes (with J. McLoud-Mann and K. Stagg)
Joint Meetings of the AMS and MAA, Baltimore, MD 2014
- Inflection Points of Reliability Polynomials (with D. Milan)
CombinaTexas 2013 Meeting, Houston, TX 2013
- Counting Fullerene Patches (with S. Graves)
CombinaTexas 2013 Meeting, Houston, TX 2013
- Side Lengths of Pseudoconvex Fullerene Patches (with J. McLoud-Mann)
Joint Meetings of the AMS and MAA, San Diego, CA 2013
- Boundaries of Nice Fullerene Patches
CombinaTexas 2012 Meeting, Georgetown, TX 2012
- Boundary Conditions of Fullerene Patches
Texas Section MAA Conference, Dallas, TX 2012
- All Fullerenes Great and Small
Stephen F. Austin University Colloquium, Nacogdoches, TX 2011
- Ambiguous Fullerene Patches
5th Computers in Scientific Discovery Conference, Sheffield, England 2010

Teaching Talks

Defining and Teaching for Student Success	
<i>UT System Academy of Distinguished Teachers 2020 Winter Conference</i>	2020
Undergraduate Research at UT Tyler	
<i>UT Tyler Faculty Development Workshop</i>	2017
Actively Engaging Students: A Panel Discussion (with S. Doty, C. Major, and B. Woolridge)	
<i>UT Tyler Faculty Development Workshop</i>	2016
Innovative approaches to classroom learning (with L.-K. Lauderdale)	
<i>Texas Section MAA Conference, Nacogdoches, TX</i>	2016
Friday Fun Day! (with S. Graves and L.-K. Lauderdale)	
<i>UT Tyler Faculty Development Workshop</i>	2016
Incorporating Undergraduate Research as a Capstone Project	
<i>Texas Section MAA Conference, San Antonio, TX</i>	2015
Incorporating an Undergraduate Research Component in your Major	
<i>UT Tyler Faculty Development Workshop</i>	2015
Mentoring Undergraduate Research	
<i>UT Tyler Faculty Development Workshop</i>	2014, 2015
Giving a Good Math Talk	
<i>UT Tyler REU</i>	Annually since 2014
Teaching Moment: Blind Journals	
<i>UT Tyler Faculty Development Workshop</i>	2014
Faculty Sharing Session: Technology in the Technical Classroom	
<i>UT Tyler Faculty Development Workshop</i>	2012
Interdisciplinary Lecture Series (with J. McCloud-Mann)	
<i>Joint Meetings of the AMS and MAA, Boston, MA</i>	2012
How to Give a Good Math Talk	
<i>UT Tyler REU</i>	2011

Student Talks

UT Tyler Math Club Talks

Math Balderdash	2012, 2017, 2018
Can you hear me now? My network is better than yours	2016, 2018
Competition: Writing the number 1	2016
Math and fullerenes	2015
Math Jeopardy	2014
Sit or stand: Fun with dice	2014
The stability of fullerenes	2012
How many pentagons are on a soccer ball?	2011
Which strategy is best?	2009
Sonya Kovalevsky Day Talk, Tyler, TX	
Dice Game Strategies	2010

Service to University

Department Service

Department Tenure and Promotion Committee (Chair)	2019
Department Hiring Committee (Chair)	2017, 2018, 2019
Department Curriculum Committee (Chair)	2018–present
Department Governance Committee (Chair)	2018, 2019
Department Awards Committee (Chair)	2018, 2024
Department Awards Committee	2017, 2020
Department Tenure and Promotion Committee	2015–present
Department Bulletin Board Organizer	2010–2017
Department Technology Committee	2015, 2016
Department Student Workers Committee	2014, 2015
Department Honors Committee (Chair)	2015
Department Hiring Committee	2011, 2014, 2016, 2022
Department Graduate Committee	Biennially
Department Curriculum Committee	Biennially
Department Student Advisor	2009–present
Department Master’s Exam Committee Member	2010–present

College of Arts and Sciences Service

Department of Chemistry Tenure and Promotion Committee	2023
College of Arts and Sciences Tenure and Promotion Committee (Chair)	2022
College of Arts and Sciences Tenure and Promotion Committee	2021
College of Arts and Sciences Curriculum Committee (Chair)	2019–2020
College of Arts and Sciences Curriculum Committee	2018–2019
College of Arts and Sciences Governance Committee	2013–2015
College of Arts and Sciences Commencement Committee	2009–2011

University Service

Department of Mechanical Engineering Post-tenure Review Committee	2024
Faculty Awards Committee	2024–present
Student Appeals Committee	2020–2023
Vice Provost of Research & Scholarship Search Committee	2019
Parental Leave Policy Ad-hoc Committee	2019
Director of Research & Scholarship Search Committee	2018
Student Research Faculty Learning Community	2018
UT Tyler Academy of Distinguished Teachers Founding Fellow	2020–present
UT Tyler Academy of Distinguished Teachers (Secretary)	2016–2020
University Faculty Awards Committee	2014–2017
University Distance Education Advisory Committee	2017
Graduate School Representative for Doctoral Defense	2017
Teaching Excellence and Innovation Initiative Member	2012, 2013
University Core Curriculum Initiative Member	2012

Service to Students

UT Tyler “Lyceum: Student Research Showcase”

Judge for student posters and presentations	2016, 2018, 2020, 2021
Organizer for a campus-wide research showcase	2016, 2017

Math Club Advisor

2011–2016, 2019–2020

Organized an interdisciplinary lecture series with other departments on campus
Organized biweekly meetings average over 40 attendees per meeting

Co-curricular Awards

2012, 2013, 2016

Awarded \$800 to travel with 13 undergraduates to MAA Texas Section meeting in Nacogdoches, TX
Awarded \$800 to travel with 6 undergraduates to MAA Texas Section meeting in Lubbock, TX
Awarded \$769 to travel with 3 undergraduates to Nebraska Conf. for Undergraduate Women in Math
Awarded \$579 to travel with 6 undergraduates to MAA Texas Section meeting in Dallas, TX

Putnam Exam Coordinator

2009–2012

Organized weekly practices for undergraduates competing in the national Putnam exam

Master Advisor

2009–present

Completed four training modules on becoming a better academic advisor
Formal advisor to over twenty math majors

Service to Profession**Associate Editor for *Networks***

2020–present

Invited Journal Referee

AIMS Mathematics, Algorithmica, Discrete Applied Mathematics, Discrete Mathematics, Discrete Mathematics and Theoretical Computer Science, Discussiones Mathematicae Graph Theory, IEEE Transactions on Reliability, International Transactions in Operational Research, Journal of Algebraic Combinatorics, Networks, Theoretical Computer Science

Invited Reviewer of Discovery Grant applications for NSERC

2016, 2017

Career Panelist

2016

Tyler Junior College STEAM Career Day

Young Mathematicians Conference Abstract Judge

2015

Judged over 100 undergraduate research abstracts.

Texas Undergraduate Mathematics Conference Organizer

2015

Co-organized the 11th Annual Texas Undergraduate Mathematics Conference

Career Panel Moderator

2010, 2015

6th Annual Texas Undergraduate Mathematics Conference
11th Annual Texas Undergraduate Mathematics Conference

Combinatorics Room Organizer

2012

Texas Undergraduate Mathematics Conference

Faculty Sharing Session Speaker

2012

Led a workshop on how to use different technology in the classroom.

MAA Conference Food Committee Chair

2010–2011

Organizer of all meals and snacks for the Texas Section MAA conference.

Service to K-12 Education**Question and Answer Session with Keller Collegiate Academy**

2024

Academic Rodeo Presenter

2022

Reader for AP Statistics Exams	2020
Guest speaker at Owens Elementary	
“Dice Sum Distributions,” 4th grade presentation	2018
“Edible 3D Shapes,” Kindergarten presentation	2017
“Bouncing Ball Height Comparisons,” 3rd grade presentation	2017, 2018
“Dice Probabilities,” 2nd grade presentation	2017
“Math and Fruit Loops,” 1st and 2nd grade presentation	2016
High School Pentathlon Contributor	2014
East Texas State Fair	
Sonya Kovalevsky Day Committee (member, chair)	2010, 2011
Organized a Sonya Kovalevsky Day conference at UT Tyler for high school females.	

Service to Community

Catholic Charities Board Member	2016–2021
Faith Formation Teacher	2015–present
5th grade religion teacher at St. Mary Magdalene Church, Flint, TX	
Vacation Bible School Organizer	2013–2017

Teacher Training

UT System Academy of Distinguished Teacher’s Conference on Teaching in Texas	2021
UT System Academy of Distinguished Teachers - 2020 Winter Conference	2020
Project NExT Workshops	
<i>Texas Section MAA Conference, Nacogdoches, TX</i>	2016
<i>Texas Undergraduate Mathematics Conference, Tyler, TX</i>	2015
<i>Texas Section MAA Conference, San Antonio, TX</i>	2015
<i>Texas Section MAA Conference, Tyler, TX</i>	2011
<i>Texas Section MAA Conference, Abilene, TX</i>	2010
<i>Texas Undergraduate Mathematics Conference, Huntsville, TX</i>	2009
Faculty Development Workshops at UT Tyler	
Syllabus Design: From Boring to Bravo!	2024
Problem-Based Learning in Precalculus	2024
Positive Identity in the Classroom: Belonging, Value, and Student Engagement	2022
Small Teaching - Everyday Lessons from the Science of Learning	2022
Connecting with Students in an Online Environment	2020
Online Proctoring	2020
Faculty Learning Community on Work-Life Balance	2019
Celebration of Service Learning	2018
Service Learning Showcase	2017
Canvas 101	2017
Changing the Culture: Teaching Students how to Brand their Skills and Abilities	2017
Teaching Town Hall: Millennial Students and Digital Distractions	2017
Digital Storytelling Apertures: Mobile Green Screens and Beyond	2017
Raising Students Metacognitive Awareness of Reading Strategies	2017
Re-visioning Research’s Think-Aloud Protocol	2017
Teaching Town Hall: Undergraduate Research	2017
Actively Engaging Students	2016
Building Bridges Between K-12 and Higher Education	2016

Teaching Town Hall: A Celebration of Teaching	2016
Improving Student Retention	2016
Introduction to Teaching & Learning	2015
Tips for Developing and Maintaining Industry Relationships for Faculty	2015
Using Games for Informal Assessment	2015
UT Tyler Symposium on Research and Creativity	2015
Collaboration in Group Work	2015
Designing for Instructor Presence	2015
Blackboard Grade Center and Retention Center	2015
Video Lecturing	2015
Zoom Training	2015
Introduction to Online Teaching & Learning	2015
Evaluating Participation and Discussion	2015
Revising Your Course	2015
Meaningful Discussions	2015
Building Community	2015
Open Educational Resources	2015
Teaching Moments	2014
The Flipped Classroom	2014
The Online Classroom	2012
Classroom Management	2011
The Inclusive Classroom	2011
Tegrity: Capturing the Classroom	2011
Minicourse at <i>MathFest 2014</i>, Portland, OR	2014
Instructional Supports for Implementing Inquiry-Oriented Curricula	
Online Mathematica Seminar - Topics in First Year Calculus	2010

Courses Taught

MATH 1325 - Mathematics for Business and Economics II
 MATH 1342 - Statistics
 MATH 2113 - Calculus I Computer Lab (supervising instructor)
 MATH 2114 - Calculus II Computer Lab (supervising instructor)
 MATH 2330 - Discrete Mathematics
 MATH 2312 - Precalculus
 MATH 2413 - Calculus I
 MATH 2413 - Calculus I (*online section*)
 HNRS 2413 - Honors Calculus I
 MATH 2414 - Calculus II
 HNRS 2414 - Honors Calculus II
 MATH 3104 - Multivariate Calculus Computer Lab (supervising instructor)
 MATH 3203 - Matrix Methods
 MATH 3305 - Ordinary Differential Equations
 MATH 3336 - Abstract Algebra I
 MATH 3336 - Abstract Algebra I (*online section*)
 MATH 3345 - Real Analysis I
 MATH 3351 - Probability and Statistics for Engineers and Scientists
 MATH 3425 - Foundations of Mathematics
 MATH 3404 - Multivariate Calculus
 MATH 4160 - Senior Seminar I

MATH 4161 - Senior Seminar II

MATH 4336 - Abstract Algebra II

MATH 4350 - Theory of Probability

MATH 4351 - Applied Statistics

MATH 5322 - Graph Theory (graduate course)

MATH 5331 - Algebraic Structures (graduate course)

MATH 5333 - Topics in Algebra (graduate course)

MATH 5391 - Combinatorics (graduate course)

MATH 5391 - Topics in Graph Theory (graduate course)

MATH 5391 - Combinatorial Game Theory (graduate course)