

# Curriculum Vitae

as of January 25, 2024

## Charles David Leach

### Academic Achievement

<b>Institution</b>	<b>Discipline</b>	<b>Degree</b>	<b>Year</b>
Auburn University	Mathematics	Ph.D.	2002
Auburn University	Mathematics	M.A.M.	1999
Auburn University-Montgomery	Mathematics	B.S.	1997

### Honors Since 2015

- Outstanding Teacher Award (Mathematics), Department of Computing and Mathematics, 2022.
- Adult Learner & Military Friendly Faculty award from the Center for Adult Learners and Veterans, 2019
- Engage West Award, 2018
- UWG Faculty of the Year, Advanced Academy of Georgia, 2015

### Honors Before 2015

- Dr. Donald Wagner Honors College Professor of the Year Award from UWG Honors College, 2012.
- College of Science and Mathematics Excellence in Teaching Award, 2011.

### Appointments

<b>Date</b>	<b>Title</b>	<b>Institution and Department</b>
2015-present	Professor	University of West Georgia
2008-2015	Associate Professor	University of West Georgia
2002-2007	Assistant Professor	University of West Georgia
Summer 1999	Adjunct Instructor	Auburn University Montgomery
1997-2002	Graduate Teaching Asst.	Auburn University

### Teaching

#### **Courses Taught (2015-2024)**

MATH 1111 (College Algebra)  
MATH 1113 (Precalculus)  
MATH 1634 (Calculus I)  
MATH 2009 (Sophomore Seminar)  
MATH 2644 (Calculus II)  
MATH 2853 (Elementary Linear Algebra)

MATH 3003 (Transition to Advanced Math)  
MATH 4043 (Number Theory)  
MATH 4473/5473 (Combinatorics)  
MATH 4885 (Special Topics-Math Internship)  
MATH 4983 (Senior Project)

### **Other Courses Taught Prior to 2015**

MATH 1413 (Survey of Calculus)  
MATH 3703 (Geometry for P-8 Teachers)  
MATH 4233/5233 (College Geometry)  
MATH 4483 (Graph Theory)  
MATH 4985 (Special Topics-Discrete Math for P-8 Teachers)  
MATH 6043 (Number Theory)

### **Course Development**

Converted the following courses to an online modality, including recording/producing many short-format lecture videos.

- MATH 1634 Calculus I, 116 videos
- MATH 2644 Calculus II, 112 videos
- MATH 2853 Elementary Linear Algebra, 138 videos
- MATH 1113 Precalculus, 119 videos

### **Independent Work with Students**

- Directed 21 Senior Projects from 2015-2022
- Two students presented their projects at conference:
  - Elizabeth McCrina, Lights Out played on  $Z_7$ , Kennesaw Mountain Undergraduate Mathematics Conference on October 24, 2015
  - Chanceley Book, Survival Probabilities in Duels, Truels, and Quadruels, TROY MathFest, April 10, 2021
- Directed 17 Senior Projects from 2004-2014

### **Service to Institution:**

#### **Committee Memberships:**

Note: When a year is listed, it indicates the fall semester of an academic year. The committee membership/chairmanship continues through the following spring semester, with the exception of 2015, because I was on leave during Spring 2016. Summer committee work is indicated.

#### **Departmental Service: Department of Computing and Mathematics, UWG**

- Math Day Committee, co-chair, 2020-present
- Head of Undergraduate Studies (Math), 2021-present
- Wrote a significant portion of the Math programs Comprehensive Program Review, 2020
- Promotion (to full professor) committee for Chris Jett, 2020
- Math representative at recruiting events
  - Preview Day, 2020
  - Pack Premiere, 2021

- Fall Showcase, 2021
- CACSI Academic Showcase (Spring), 2022
- CACSI Academic Showcase (Spring), 2023

### **Departmental Service Since 2015, Department of Mathematics/Mathematics Program, UWG**

- Mathematics Program Coordinator, Fall 2023-
- Math Day Committee: 2015-2024. Chair 2016, 2017
- Assessment Committee, Chair 2017-2019
- Tenure Committee, 2008-2022. Chair 2010 and 2018.
- Full Professor Promotion committee, Chair 2019
- Head of Undergraduate Studies/Chair of Undergraduate Curriculum Committee, 2020-2021.
- Director of Undergraduate Studies/Chair of Undergraduate Curriculum Committee, 2016-2019.
- Chair's Advisory Committee, member 2008-2017
- Department Liaison to Richards College of Business, 2013-2015
- Department Liaison to Ingram Library, 2013-2020
- Student/Faculty Activities Committee, member 2003, 2010-2012, 2015, 2017. Chair 2004, 2015
- Freshman Math Committee, 2015-2019. Chair 2008-2013
- Statistics Search Committee, 2016, 2017.
- Faculty Evaluations Policies Committee, 2011-2020.
- ALEKS/Emporium Committee, 2016.
- Technology Committee, 2010, 2015, 2017, 2018, 2020.
- Scholarship Committee, 2016
- Instructor hiring committee, 2016
- Orientation representative, Summer 2016

### **Department Service Before 2015, Department of Mathematics**

- Director of Freshman Mathematics, 2008-2013
- Website Committee, chair 2002-2013, 2015
- Colloquium/Seminar Committee, 2002-2005
- Graduate Committee, 2002-2003, 2004-2005
- Space/Facilities Committee member 2005-2007, 2013-2014, chair 2005-2007

### **College / University Service Since 2015**

- CACSI:
  - Promotion and tenure committee, 2020
- COSM:
  - Curriculum Committee, 2015
  - Vision Committee, Summer 2015
  - Promotion and Tenure Committee, 2019
- UC:
  - Promotion (to senior lecturer) committee for Jim Bellon, 2020
  - Promotion (to senior lecturer) committee for Carrie Carmack, 2021
- University:
  - Gateways to Completion (G2C) committee, 2016, 2017
  - Peer Review Assessment Committee, 2018
  - General Education Assessment Committee (GEAC), 2018-2024
    - Workgroup co-coordinator for Core Area A2

- Workgroup member for Core Area D

### **College/University Service Before 2015**

- Search Committee for Director of Excel Center, member, 2013-2014
- Faculty Senate, member 2011-2013
- Academic Policies and Procedures, member 2011-2012, chair 2012-2013
- DFW Subcommittee, Spring 2011
- General University Matters, member 2007-2008
- COSM Curriculum Committee, 2013-2014
- COAS Dean's Advisory Committee, 2004-2006

### **Counseling Experience Since 2015:**

- Completed 4 classroom peer observations since 2015
- Faculty Advisor to UWG Math Club, 2021-present

### **Counseling Experience Before 2015:**

- Advisor to math majors since 2003
- Completed approximately 21 classroom observations of fellow faculty prior to 2015
- Served as official faculty mentor for
  - Minzhi Xuan
  - Brian Brodsky
  - Wenyan Zhou
- Taught in UWISE program during summer 2011 and 2013.
- Spring Orientation Math Department Representative, January 3, 2014
- Fall Orientation, Math Department Representative, August 10, 2009
- Mardi Gras of Majors, Math Department Representative, Spring 2008
- Faculty Orientation Leader, Summer 2007
- Preview Day, Math Department Representative, Spring 2008
- Visitation Day, Math Department Representative, Spring 2005
- Served on four Master of Education Comprehensive Exam Committees:
  - Fall 2004 - Margaret Cade
  - Summer 2005 - Katie Cobbs
  - Summer 2006 - Barbara Spidahl-Kungu
  - Summer 2006 - Bonnie Perkins
- Served on one Education Specialist Committee:
  - Summer 2007 - Jamy Juhan

### **Grant Work**

#### **Grants Since 2015:**

- Co-PI on STEM IV Grant: "Targeted Interventions in Precalculus and Calculus I", PI Scott Gordon, other co-PIs Carrie Carmack, Kyle Carter, Anne Gaquere-Parker, Ricky Johnson, Kwang Shin, and Scott Sykes. Funded \$105,000

- Tech Fee Grant “Online and On-Campus Math Tutoring”, funded \$30,000, 2016
- SEEP Minigrant “Using MAPLE to Enhance Learning in Calculus II”, joint work with Amin Boumenir, funded \$4500, 2016
- NSF Grant Application for REU, 2018 Grant 2017, I was senior personnel, Abi Khodkar and Bruce Landman were PI and Co-PI. Not funded.
- Served on COSM HPC (High performance computer) grant committee, as involved personnel, Fall 2018 and as other potential user in 2020 Not funded.

#### **Grants Before 2015:**

- UWISE Minigrant, “Video Solutions to the Math 1111 common final exam,” \$3700 funded 2012-2013.
- UWISE Minigrant, “Lecture Notes for Math 1111,” \$3000, funded 2013-2014, with Carrie Thielemier.
- NSF RUI Grant Proposal number 055731, Some Graph Decomposition Problems, \$67,260, not funded, submitted 2005.

#### **Other Educational Activities**

##### **Since 2015:**

- Taught workshop on math and engineering to in-service teachers during TEAMS workshop, Summer 2015
- Math Day, 2003, 2004, 2006-2022

##### **Before 2015:**

- uCode@UWG volunteer, summer 2014
- Taught mathematics to in-service teachers during SMITE (Science and Math Institutes for Teacher Education) workshop, Summer 2014 and Summer 2013.
- Taught a course titled “Simple Lego Towers and Complex Numbers” at COSM’s College For a Day 2012.
- Participated in hosting UWG Math Day, every year since 2003 except for 2005.
- Gave a talk at Columbus State University’s Math Tournament, March 1, 2014.
- Gave a talk on mathematical puzzles at Carrollton Junior High School, January 25, 2008.
- Taught UWISE Math course, summer 2011.
- Presented a poster titled “Using LEGO Bricks in the Mathematics Classroom” at USG Regional STEM Institute, held at UWG February 2010.

#### **Professional Growth:**

##### **Membership and offices in scholastic honoraries:**

- Phi Kappa Phi National Honor Society, Lifetime member since 1997

##### **Membership and offices in professional societies:**

- Institute of Combinatorics and its Applications, Fellow 2007-present
- Institute of Combinatorics and its Applications, Associate Fellow 2002-2007
- Institute of Combinatorics and its Applications, Member 2001-2002

- Mathematical Association of America, member 2005-2006.

## **Publications**

### **Since 2015**

1. Abdollah Khodkar and David Leach, "Signed magic arrays with a certain property", Springer Proceedings in Mathematics and Statistics (PROMS), Accepted (2023).
2. David Leach, "Maximum stack sizes in parallel diffusion on paths and cycles," Bulletin of the Institute of Combinatorics and its applications, submitted 2023.
3. Abdollah Khodkar and David Leach, "[Magic Rectangles with Empty Cells](#)", Utilitas Mathematica, p 45-56, 116 (2020).
4. Abdollah Khodkar and David Leach, "[Magic Squares with Empty Cells](#)", Ars Combinatoria, p 49-52, 154(2021).
5. Abdollah Khodkar, Brandi Ellis, and David Leach, "Signed Magic Rectangles with Three Filled Cells in Each Column," Bulletin of the Institute of Combinatorics and its Applications, p 87-106, 90 (2020).
6. David Leach, "[Chasing the lights in Lights Out](#)", Mathematics Magazine, 90, no 2, 126-133 (2017).
7. David Leach, "[Proof Without Words: Powers of Three and Triangular Numbers](#)", The College Mathematics Journal, 46, no 2 (2016).

### **Before 2015**

8. David Leach, "Modular Leech Trees of Order at Most 8," International Journal of Combinatorics, (2014).
9. David Leach and Matt Walsh, Generalized Leech Trees, *J. Combin. Math. Combin. Comput.* 78 (2011), 15–22.
10. Abdollah Khodkar and David Leach, "The Chromatic Number of  $K_2(9,4)$  is 11, *J. Combin. Math. Combin. Comput.* 70 (2009), 217–220
11. Atif Abueida, Sally Clark, and David Leach, "Multidecomposition of the complete graph into graph pairs of order 4 with various leaves", *Ars Combin.* 93 (2009), 403–407
12. Clay Culver and David Leach, "Equivalence Classes of 5-Bit Gray Codes", *Australas. J. Combin.* 39 (2007), 129–134
13. Matt Walsh and David Leach, "A characterization of lattice-ordered graphs", *Combinatorial number theory*, 327–332, *de Gruyter, Berlin*, 2007.
14. D.J. Ashe, David Leach, C. A. Rodger, "2-Regular Leaves of Partial 8-cycle Systems", *Australas. J. Combin.* 39 (2007), 3–17.
15. Abdollah Khodkar, David Leach, and David Robinson, "Every  $(2,r)$ -Regular Graph is Regular", *Util. Math.* 73 (2007), 169–172.
16. Abdollah Khodkar and C. D. Leach, "On  $(2,r)$ -Regular Graphs", Bulletin of the Institute of Combinatorics and its Applications, 46, 27-34 (2006).
17. C. D. Leach, Darryn Bryant, and C. A. Rodger, "Hamilton Decompositions of Complete Bipartite graphs with a 3-Factor Leave", *Australasian Journal of Combinatorics*, 31, 331-336 (2005).
18. C. D. Leach and C. A. Rodger, "Hamilton Decompositions of Complete Graphs with a 3-Factor Leave", *Discrete Math* 279: 337-344 (2004).
19. C. D. Leach and C. A. Rodger, "Hamilton Decompositions of Complete Multipartite Graphs with any 2-Factor Leave", *Journal of Graph Theory*, 44: 208-214 (2003).
20. C. D. Leach and C. A. Rodger, "Fair Hamilton Decompositions of Complete Multipartite Graphs", *Journal of Combinatorial Theory Series B* 85, 290-296 (2002).

21. C. D. Leach and C. A. Rodger, "Non-disconnecting Disentanglements of Amalgamated 2-factorizations of Complete Multipartite Graphs", *Journal of Combinatorial Designs*, 9 (2001).
22. Peter D. Johnson, Jr. and David Leach. Problem number 659 of "Problems and Solutions", *The College Mathematics Journal*. Vol.30, No.4 (September 1999). p. 319.

## **Presentations**

### **Since 2015**

1. "Maximum stack sizes in parallel diffusion on paths and cycles," Integers Conference 2023, University of Georgia, May 19, 2023.
2. "Counting with Algebra: Unleashing the Power of Power Series", Invited Address, Troy Mathfest April 9, 2022
3. "Targeted Interventions in Precalculus and Calculus", poster presentation, done jointly with Scott Gordon, Anne Gaquere, Scott Sykes, Carrie Carmack, Ricky Johnson, AAC&U STEM Virtual Conference, November 5, 2021
4. "McNuggets, Money, and Mathematics!", talk given to UWG Math Club, November 1, 2021
5. "Lights Out and Linear Algebra", Invited address, Troy MathFest 2019, Troy University, April 2019.
6. "Magic Rectangles with empty cells", 47th SEICCGTC, Florida Atlantic University, March 7, 2019.
7. "Modular Leech Trees of Order at Most 9," 47th SEICCGTC, Florida Atlantic University, March 2016
8. "Modular Leech Trees," UWG Discrete Math Seminar, Fall 2015
9. Sines and Sounds: Musical Harmonics and Trigonometry," University of West Georgia Math Day, March 27, 2015
10. Sines and Sounds: Musical Harmonics and Trigonometry, Columbus State University Math Tournament keynote talk, March 7, 2015.

### **Before 2015**

11. Modular Leech Trees, 56th Midwestern Graph Theory Conference, October 2014
12. "John Leech's Tree Labeling Problem and Some Variations," UWG Department of Mathematics Research Experience for Undergraduates, July 11, 2014.
13. "Graphs and Legos: Fun Applications of Discrete Math," University of West Georgia's Math Day. March 7, 2014.
14. "Discrete Math in Everyday Life," Columbus State University Math Tournament keynote talk, March 1, 2014.
15. "Discrete Mathematics," University of West Georgia's Math Day, 2010.
16. "Z<sub>2</sub> Leech Trees", DANGER 2K9, Southern Polytechnic State University, July 18, 2009
17. "Some Results on the Watchman Number of Trees," 40<sup>th</sup> Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Florida Atlantic University, March 3, 2009
18. "Mathematical Puzzles," talk given at Carrollton Junior High School, January 25, 2008.
19. "The chromatic number of  $K^2(9, 4)$ ", 38th Southeastern International Conference on Combinatorics, Graph Theory and Computing. Florida Atlantic University. March 2007.
20. Equivalence Classes of 5-Bit Gray Codes, DANGER 2K6, Huntingdon College, July 2006.
21. "Lattice-Ordered Graphs", Integers Conference 2005 Invited speaker, University of West Georgia, October 2005.
22. "Adjacency Matrices, Non-Adjacency Matrices, and  $(2,r)$ -Regular Graphs", IPFW Department of

Mathematical Sciences Invited Colloquium, June 2005.

23. "Order 4 graph pair multidecompositions of  $K_n$  with various leaves". 36<sup>th</sup> Southeastern International Conference on Combinatorics, Graph Theory and Computing, Florida Atlantic University, March 2005.
24. "Hamilton Decompositions of Complete Bipartite Graphs with a 3-Factor Leave". 35<sup>th</sup> Southeastern International Conference on Combinatorics, Graph Theory and Computing. Florida Atlantic University. March 2004
25. "Fair Hamilton Decompositions." 33<sup>rd</sup> Southeastern International Conference on Combinatorics, Graph Theory and Computing. Florida Atlantic University. March 2002.
26. "Hamilton Cycles of  $K_{n,n}$  2-factor". 31<sup>st</sup> Southeastern International Conference on Combinatorics, Graph Theory and Computing. Florida Atlantic University. March 2000.

### **Professional Service**

#### **Since 2015:**

- AMS Special Session organizing committee, 2019.
- Refereed two papers for JCMCC, 2018
- Midwest Conference on Combinatorics and Combinatorial Computing, organizing committee, 2017.
- Organizing committee member for INTEGERS Conferences in 2018, 2020 (though 2020 was canceled because of covid), and 2023

#### **Before 2015:**

- Refereed 16 journal articles for the following journals:  
Discrete Math, INTEGERS-Electronic Journal of Combinatorial Number Theory, Ars Combinatoria, JCMCC, Bulletin of the Institute of Combinatorics and its Applications, Tamkang Journal of Mathematics, Utilitas Mathematica, Australasian Journal of Combinatorics
- Helped to host the INTEGERS Conference here at UWG in 2003, 2005, 2007, 2009, 2011, and 2013.
- Reviewed the article "Even subgraphs of bridgeless graphs and 2-factors of line graphs." by Jackson, Bill; Yoshimoto, Kiyoshi, Discrete Math. 307 (2007), no. 22, 2775–2785.
- Scholar-in-Residence, Indiana University-Purdue University Fort Wayne, June 2005.