Curriculum Vitae

Education

- 2023 **Certificate, Applied Data Science with Python**, *University of Michigan (Coursera)*Five-course specialization sequence in Applied Data Science. Credential URL
- 2012–2017 **Ph.D., Mathematics and Statistics**, *Georgia State University*Research specialization in Collegiate Mathematics Education.

 Dissertation investigated how students develop an understanding of proof by contradiction.
- 2007–2010 B.S., Mathematics, University of Florida

Professional Experience

- 2021-present **Assistant Professor**, Department of Mathematics, Science, & Technology, Embry-Riddle Aeronautical University Worldwide
 - 2017-2021 Assistant Instructional Professor, Department of Mathematics, University of Florida
 - 2013-2017 Graduate Teaching Assistant, Department of Mathematics and Statistics, Georgia State University
 - 2011-2012 Teacher, Mathematics, William T. Dwyer High School, Palm Beach County, FL

Administrative Experience

- - 2015–2016 Emporium Lab Coordinator, Department of Mathematics and Statistics, Georgia State University

External Research Funding Experience

- \$382,578 **Co-Principal Investigator**, *NSF IUSE: Undergraduate Research for Fully Online STEM Students:* funded *Impact of Expanded Curricular Options on STEM Attitudes, Identity, & Career Ambitions*, with Robert Deters (PI), Emily Faulconer (co-PI), Brent Terwilliger (co-PI). 2023-2026.
- \$233,298 **Co-Principal Investigator**, *NSF IUSE: Community of Inquiry and Cognitive Load in Online STEM:* funded *Persistence, Performance, and Perspectives*, with Emily Faulconer (PI) and Beverly Wood (co-PI). 2021-2024.
- \$271,543 **Principal Investigator**, *NSF IUSE: Drilling Down into Concepts with Automatic and Diagnostic* unfunded *Item Generation (Auto-DIG)*, with Annie Burns-Childers (co-PI), Catherine Paolucci (co-PI), and Russell Jeter (consult). Submitted October 2020.
- \$202,184 **Co-Principal Investigator**, *NSF: Using Video to Expand Communication of Mathematical Sciences* unfunded *Research*, with Catherine Paolucci (PI). Submitted October 2020.
- \$99,960 **Principal Investigator**, *NSF ECR Core Research: Analyzing a Novel College Algebra Curriculum* unfunded and Implementation, with Russell Jeter (consult). Submitted October 2019.
- \$340,764 **Graduate Research Assistant (2016–2017); Other Professional (2017–present)**, *NSF IUSE:*funded *Promoting Reasoning in Undergraduate Mathematics (PRIUM)*, with Draga Vidakovic (PI), Valerie Miller (Co-PI), and Guantao Chen (Co-PI). 2016-2022.

Internal Research Funding Experience

- \$6,000 **Principal Investigator**, *ERAU-W Faculty Seed Grant: Collective Knowledge Progression and* funded *Proliferation in Asynchronous Calculus Discussion Boards*, with Zackery Reed (co-PI) and Karen Keene (co-PI). 2023.
- \$4,069 **Principal Investigator**, *ERAU-W Faculty Seed Grant: Developing Autonomous, Targeted Feedback* funded in *Precalculus*, 2021-2022.
- \$29,923 **Co-Principal Investigator**, *UF Internal Grant: Examining and addressing the content knowledge* funded development needs of Florida's aspiring and newly-qualified mathematics teachers, with Catherine Paolucci (PI) and Christopher Redding (Co-PI). 2020-2021.

Journal Articles Under Review

- [1] Reed, Z. & Chamberlain Jr., D. (under review Mar 2023, accepted for chapter submission Jul 2023). A Framework for Analyzing Asynchronous Discussion Activities. Teaching and Learning Mathematics Online 2e, CRC Press, FL.
- [2] Paolucci, C., **Chamberlain Jr., D.**, Redding, C., Vancini, S., & Reese, A. (first submission Nov 2021, revised and resubmitted Aug 2022). *Critical lessons from certification exam preparation materials for mathematics teachers' content knowledge and professional learning*. Journal of Teacher Education.

Peer-Reviewed Journal Articles

- [1] **Chamberlain Jr., D.** (2023). How one instructor can teach a large-scale, mastery-based College Algebra course online. Problems, Resources, and Issues in Mathematics Undergraduate Studies. DOI: 10.1080/10511970.2023.2190183.
- [2] Faulconer, E., **Chamberlain Jr., D.**, & Woods, B. (2022). *A Case Study of Community of Inquiry Presences and Cognitive Load in Asynchronous Online STEM Courses*. Online Learning Journal. DOI: http://dx.doi.org/10.24059/olj.v26i3.3386.
- [3] Chamberlain Jr., D. & Vidakovic, D. (2021). Cognitive trajectory of proof by contradiction for Transition-to-Proof students. Journal of Mathematical Behavior. DOI: 10.1016/j.jmathb.2021.100849.
- [4] Chamberlain Jr., D. & Jeter, R.¹ (2020). Creating diagnostic assessments: Automated distractor generation with integrity. Journal of Assessment in Higher Education. DOI: 10.32473/jahe.v1i1.116892.
- [5] Chamberlain Jr., D., Grady, A., Keeran, S., Knudson, K., Manly, I., Shabazz, M., Stone, C., & York, A. (2020). Transitioning to an active learning environment for calculus at the University of Florida. Problems, Resources, and Issues in Mathematics Undergraduate Studies. DOI: 10.1080/10511970.2020.1769235
- [6] Stalvey, H., Burns, A., **Chamberlain Jr., D.**, Kemp, A., Meadows, L., & Vidakovic, D. (2019). *Students' understanding of the concepts involved in hypothesis testing for one population.* Journal of Mathematical Behavior. DOI: 10.1016/j.jmathb.2018.03.011

Peer-Reviewed Conference Proceedings [asterisk denotes presenter]

- [1] Chamberlain Jr., D.*, Reed, Z.*, & Keene, K. (2023, Feb 23-25). Adapting the Argumentative Knowledge Construction Framework to Asynchronous Mathematical Discussions. 25th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME.
- [2] Bailey, T.*, **Chamberlain Jr., D.***, & Christodoulopoulou, K. (2022, Feb 24-26). *Undergraduate's covariational reasoning across function representations*. 24th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME.
- [3] Reed, Z.*, **Chamberlain Jr., D.***, & Keene, K. (2022, Feb 24-26). *Argumentative knowledge construction in asynchronous calculus discussion boards.* Poster at 24th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME, Boston, MA.
- [4] Kemp, A.*, **Chamberlain Jr., D.**, Cooley, L., Miller, V., & Vidakovic, D. (2020, Feb 27-29). *Student self- and simulated peer-evaluation of proof comprehension: Tina*. 23rd Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME.
- [5] Chamberlain Jr., D.* & Jeter, R. (2019, Feb 28 Mar 2). Leveraging cognitive theory to create large-scale learning tools. 22nd Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME.
- [6] Chamberlain Jr., D.* & Vidakovic, D. (2018, Feb 22-24). Developing proof comprehension and proof by contradiction through logical outlines. 21st Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME.
- [7] Burns, A.*, **Chamberlain Jr., D.**, Kemp, A.*, Meadows, L., Stalvey, H., & Vidakovic, D. (2018, Feb 22-24). *Reasoning about one population hypothesis testing: The case of Steve.* 21st Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME.
- [8] Chamberlain Jr., D.* & Vidakovic, D. (2017, Feb 23-25). Developing student understanding: The case of proof by contradiction. 20th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME.

¹Co-first authors.

- [9] Burns, A.*, **Chamberlain Jr., D.**, Kemp, A.*, Meadows, L., Stalvey, H., & Vidakovic, D. (2017, Feb 23-25). *Students' understanding of test statistics in hypothesis testing*. 20th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME.
- [10] Abel, T.*, Brazas, J.*, Chamberlain Jr., D., & Kemp, A. (2017, Feb 23-25). Characterizing mathematical digital literacy: A preliminary investigation. 20th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME.
- [11] **Chamberlain Jr., D.*** & Vidakovic, D. (2016, Feb 25). *Use of strategic knowledge in a transition-to-proof course: Differences between an undergraduate and graduate student*. 19th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME.

Conference Presentations [asterisk denotes presenter]

- [1] **Chamberlain Jr., D.*** (2023, Aug 2). *Technology Use in Undergraduate Mathematics Classrooms*. 2023 MAA MathFest, Tampa, FL.
- [2] **Chamberlain Jr., D.***, Reed, Z.*, Rister, A.*, & Velez, M.* (2023, Feb 7). Roundtable discussion: *Practical Suggestions to Improve Online Discussions Across Disciplines*. 2023 Academic Innovation Virtual Conference hosted by ERAU-W (virtual).
- [3] Faulconer, E.*, **Chamberlain Jr., D.***, & Woods, B. (2022, April 13). *Instructional Efficiency in Asynchronous Online Discussions*. Online Learning Consortium Innovate Conference, Dallas, TX.
- [4] Paolucci, C.*, **Chamberlain Jr., D.**, & Vancini, S.* (2022, Apr 7). *Investigating alternatively-certified teachers' mathematical knowledge for teaching calculus.* Joint Mathematics Meeting, Seattle, WA.
- [5] Chamberlain Jr., D.*, Reed, Z., & Keene, K. (2021, Nov 20). Investigating social construction of knowledge during asynchronous discussions. 5th Northeastern Conference on Research in Undergraduate Mathematics Education. New Brunswick, NJ (virtual).
- [6] Babiceanu, L.* & Chamberlain Jr., D. (2021, Feb 20). Analyzing student achievement with residential and online students in College Algebra. Florida Section of the Mathematical Association of America and Florida Two-Year College Mathematics Association 2021 Joint Meeting, Gainesville, FL (virtual).
- [7] **Chamberlain Jr., D.*** & Jeter, R. (2021, Jan 7). Automated AF: Leveraging augmented intelligence to provide automated, actionable feedback. Joint Mathematics Meeting, Washington, D.C. (virtual).
- [8] Chamberlain Jr., D.* & Jeter, R. (2020, Oct 20). Incorporating Augmented Intelligence to Enhance Learning: Automatic and Diagnostic Item Generation (Auto-DIG). STEMpowered Faculty Symposium, Gainesville, FL (virtual).
- [9] Chamberlain Jr., D.* & Vidakovic, D. (2020, Oct 3). Potential cognitive obstacles to understanding proof by contradiction. 4th Northeastern Conference on Research in Undergraduate Mathematics Education. Philadelphia, PA (virtual).
- [10] Chamberlain Jr., D.* (2020, Jul 30). Drilling down into content with Auto-DIG: Automatic Diagnostic Item Generation. MAA MathFest, Philadelphia, PA. Session canceled due to COVID-19 pandemic.
- [11] Chamberlain Jr., D.* (2020, Jan 18). Mastery-based assessment in a large-enrollment online College Algebra course. Joint Mathematics Meeting, Denver, CO.
- [12] Chamberlain Jr., D., Knudson, K., Grady, A.*, Keeran, S., Manly, I., Shabazz, M., Stone, C., & York, A. (2020, Jan 18). Active Calculus at the University of Florida. Joint Mathematics Meeting, Denver, CO.
- [13] Chamberlain Jr., D.* & Jeter, R. (2019, Apr 5). Creating diagnostic assessments: Automated distractor generation with integrity. 2019 Assessment in Higher Education: Enhancing Institutional Excellence, Gainesville, FL.
- [14] Jeter, R.* & Chamberlain Jr., D. (2018, Mar 24). A novel method for creating assessment and diagnostic tools in the classroom. MAA Southeastern Spring Sectional Meeting, Clemson, SC.
- [15] Chamberlain Jr., D.* & Vidakovic, D. (2017, Mar 11). Active learning in transition-to-proof courses: An example lesson of proof by contradiction. AMS Southeastern Spring Sectional Meeting, Charleston, SC.
- [16] **Chamberlain Jr., D.*** & Vidakovic, D. (2017, Jan 5). A first lesson on proof by contradiction: Developing proof comprehension in a transition-to-proof course. Joint Mathematics Meeting, Atlanta, GA.

- [17] **Chamberlain Jr., D.***, Kemp, A.*, Meadows, L.*, Stalvey, H., Vidakovic, D., & Burns, A. (2016, Mar 5). *The emporium model for elementary statistics: A preliminary report*. AMS Southeastern Spring Sectional Meeting, Athens, GA.
- [18] Chamberlain Jr., D.* & Vidakovic, D. (2015, Apr 17). APOS Theory in the classroom. Center for Instructional Effectiveness Annual Conference, Atlanta, GA.
- [19] **Chamberlain Jr., D.***, Vidakovic, D., Stalvey, H., Burns, A., Meadows, L., & Kemp, A.* (2015, Apr 10). *Student understanding of one population hypothesis testing: A piece of the process*. Mathematics Graduate Student Miniconference, Atlanta, GA.
- [20] **Chamberlain Jr., D.*** & Vidakovic, D. (2015, Apr 10). *Teaching proofs with APOS Theory*. Mathematics Graduate Student Miniconference, Atlanta, Ga.

Invited Talks

- [1] **Chamberlain Jr., D.** (2023, Mar 29). *Predicting Students' Thoughts to Provide Elaborative Feedback*. Invited by California State University Bakersfield Mathematics Department Seminar Series.
- [2] Faulconer, E., Bourdeau, D., Kiernan, K., & Chamberlain Jr., D. (2023, Jan 21). *Non-Traditional Scholarly Publication*. Invited by Embry-Riddle Aeronautical University Worldwide Research Scholars Program.
- [3] Chamberlain Jr., D. & Faulconer, E. (2022, Apr 21). How We Manage Large-Scale Data Collection. Invited by Embry-Riddle Aeronautical University Worldwide College of Arts and Sciences Brown Bag Lunch & Learn Series.
- [4] Paolucci, C. & Chamberlain Jr., D. (2021, Mar 25). A profile of the content knowledge development needs of Florida's alternatively-certified teachers. Invited by University of Florida Education Policy Research Center Research Brown Bag Series.
- [5] **Chamberlain Jr., D.** (2020, Nov 13). *Integrating Augmented Intelligence into Mathematics Education*. Invited by Florida International University Mathematics Education Seminar.
- [6] **Chamberlain Jr., D.** (2020, Sept 17). *Automatic and Diagnostic Item Generation*. Invited by the University of Florida Lastinger Center.

Conference Session/Workshop Organization

- [1] **Chamberlain Jr., D.** & Barber, R. (2023, Aug 2). Session: *Unspoken Research Components*. 2023 MAA MathFest, Tampa, FL.
- [2] **Chamberlain Jr., D.** & Barber, R. (2023, Aug 2). Session: *Building a Research Program*. 2023 MAA MathFest, Tampa, FL.
- [3] Chamberlain Jr., D., Reed, Z., & Keene, K. (2023, Feb 23). Workshop: Research on Technology in Undergraduate Mathematics Education. 25th Annual Conference on Research in Undergraduate Mathematics Education: SIGMAA on RUME, Omaha, NE.
- [4] Chamberlain Jr., D., Acu, B., & Gasiorek, S. (2023, Jan 3). Session: Navigating the Early Years of the Faculty Experience. 2023 Joint Mathematics Meeting, Boston, MA.
- [5] Vidakovic, D., Stalvey, H., Chamberlain Jr., D., Kemp, A., Meadows, L., & Kellam, A. (2018, Mar 23-24). Session: Active Learning in Undergraduate Mathematics. MAA Spring 2018 Southeastern Section Conference, Clemson, SC.
- [6] Vidakovic, D., Stalvey, H., Chamberlain Jr., D., Kemp, A., & Meadows, L. (2017, Mar 10-12). Session: Active Learning in Undergraduate Mathematics. AMS Spring 2017 Southeastern Regional Conference, Charleston, SC.
- [7] Vidakovic, D., Stalvey, H., **Chamberlain Jr., D.**, Kemp, A., & Meadows, L. (2016, Mar 5-6). Session: *Active Learning in Undergraduate Mathematics*. AMS Spring 2016 Southeastern Regional Conference, Athens, GA.

Teaching Experience

2023-present Introduction to Programming for Data Science, Developer/Instructor

 \circ Asynchronous online with 10-20 students.

2021-present Precalculus for Aviation, Instructor

- \circ Asynchronous online with 20-30 students.
- October 2022: EagleVision with 20 students.

2021-present Precalculus Essentials, Instructor

O Asynchronous online with 20 - 30 students.

2018–2021 Analytic Geometry and Calculus I, Instructor

- $_{\odot}$ Fall 2019, Fall 2020: Special flipped class for ${\sim}15$ Pre-Health PostBac students.
- \circ Summer 2018: Special flipped classroom with \sim 20 freshmen engineering students.
- O Spring 2018: Large lecture with 200+ students.

Spring 2021 Sets and Logic, Instructor

 \circ Modified Moore's Method with \sim 30 students.

Summer 2019 Analytic Geometry and Calculus II, Instructor

 \circ Flipped class with \sim 20 students.

Spring 2019 Elementary Differential Equations, Instructor

O Large lecture with 120+ students.

2017-2021 College Algebra, Developer/Coordinator/Instructor

- \circ Multiple sections of Pure Online (\sim 150 students) and Hyrbid (\sim 200 students) per semester.
- O Curriculum overhaul with focus on understanding of functions.
- O Developed open-source online homework system/textbook with dynamically-generated problems.
- Developed automatically-generated assessments based on students' varying levels of understanding functions.

2013–2017 Various courses, Instructor of Record as graduate student

- Elementary Statistics (flipped, ~40 student sections).
- o Intermediate Algebra (traditional, ∼20 student section).
- College Algebra (flipped, ~40 student sections).
- Support for College Algebra (co-req course, flipped, ~40 student sections).
- Precalculus (flipped, ~40 student sections).

Mentoring

2020-present Undergraduate Research

2019-2020 Masters of Arts in Teaching Mathematics

2019–2021 3rd\4th year First Generation Student Life Coach

2018–2021 University Minority Mentor Program

Professional Leadership

2022-present Council Member for Mathematics Association of America Council on Teaching and Learning.

2022–present **Subcommittee Chair** for Mathematics Association of America Subcommittee on Technologies in Mathematics Education (STME). Member since 2021.

2022 **Nominating Committee Member** for the Research in Undergraduate Mathematics Education (RUME) community.

2020–2022 **Program Committee Member** for Research in Undergraduate Mathematics Education (RUME) annual conferences.

2018–2019 Huddle Leader for the Florida College System year-long Florida Mathematics Re-Design workgroups.

Professional Service

2022 Grant Reviewer for the National Science Foundation.

2017-present **Journal Reviewer** for

- Educational Studies in Mathematics since 2022;
- Mathematical Thinking and Learning since 2021;
- o International Journal of Research in Mathematics Education since 2020;
- Journal of Assessment in Higher Education since 2019;
- o Journal of Mathematical Behavior since 2017; and
- o Problems, Resources, and Issues in Mathematics Undergraduate Studies since 2017.

2017 **Poster judge** for *Joint Mathematics Meeting, Atlanta, GA*.

2016—present Conference Reviewer for Annual Conference on Research in Undergraduate Mathematics Education.

University Service

2023-present **Educational Experiences Member** for the ERAU-W Quality Enhancement Plan committee.

- 2023 Grant Reviewer for ERAU Faculty Innovative Research in Science and Technology (FIRST) grant.
- 2022 Grant Reviewer for ERAU-W Faculty SEED grant.
- 2022–2025 Academic Technology Committee Chair for ERAU-W Faculty Senate.

College Service

- 2023 Appeal Committee Member for ERAU College of Arts and Sciences.
- 2022-present Faculty Council Member for ERAU-W College of Arts and Sciences.
 - 2020–2021 Steering Committee Member for the University of Florida College of Liberal Arts and Sciences.
 - 2019–2021 **Curriculum Committee Chair** for the University of Florida College of Liberal Arts and Sciences. *Member 2019–2020.*
 - 2018 **Commencement Marshal** on behalf of the College of Liberal Arts and Sciences for the University of Florida's Spring 2018 and Summer 2018 undergraduate commencement ceremonies.

Departmental Service

- 2022–2023 **Hiring Committee Member** for tenure-track candidate in Data Science for Department of Mathematics, Science, & Technology.
- 2022-present Mathematics Minor Coordinator for ERAU-W Department of Mathematics, Science, & Technology.
 - 2022–2023 **Applied Data Science Minor Coordinator** for ERAU-W Department of Mathematics, Science, & Technology.
- 2021-present Course Mentor for ERAU-W Department of Mathematics, Science, & Technology
 - MATH 111 Pre-Calculus for Aviation (2022–present)
 - STAT 412 Probability & Statistics (2022–present)
 - o GNED 103 Basic Mathematics (2021-2022)
 - MATH 106 Basic Algebra & Trigonometry (2021–2022)
 - 2020–2021 Hiring Committee Member for tenure-track candidate in University of Florida College of Education.
 - 2017–2021 Committee Member at University of Florida Department of Mathematics.
 - Teaching Methods (Chair 2019–2021);
 - Online Course Development;
 - Teaching Assistant Training; and
 - Undergraduate Committee Lower Division.

Professional Affiliations

- 2023-present **Tech in Math Ed (TiME) Organizer** for the special topic research group of SIGMAA on RUME.
- 2015-present **SIGMAA on RUME**: Special Interest Group of the Mathematical Association of America on Research in Undergraduate Education
- 2015-present MAA: Mathematical Association of America

Awards and Fellowships

- Apr 2023 Recognition Award, 2022-2023 ERAU-WW COAS Faculty Council Collegiality nominee.
- Apr 2023 Monetary Award, 2022-2023 Faculty 'Superstar' Champion badge from ERAU-WW COAS Dean and Chancellor.
- 2022–2023 Fellowship, Mathematics Association of America Project NExT. Red22 cohort.

Travel Grants

- 2023 **External**, from Institute for Mathematics and its Applications University of Minnesota for Workshop on Developing Online Learning Experiments Using Doenet, May 22-26.
- 2023 **Internal**, from ERAU-W Faculty Development Research Program for Conference on Research in Undergraduate Mathematics Education, February 23-25.
- 2022 **Internal**, from ERAU-W Faculty Development Research Program for Joint Mathematics Meeting 2022, January 5-8
- 2021 **Internal**, from UF Center for Applied Mathematics for Joint Mathematics Meeting 2021, January 6-9

- 2020 Internal, from UF College of Liberal Arts and Sciences for Joint Mathematics Meeting 2020, January
- 2017 External, from the American Mathematical Society for the AMS Spring 2017 Southeastern Sectional Meeting, March 10-12

Notable Coursework

Mathematics 33 Graduate-Level Credit Hours: Advanced Matrix Analysis I & II, Abstract Algebra I & II, Real Analysis I & II, Partial Differential Equations, Special Topics in Mathematics I & II (Topology, Graph Theory), Directed Research (Graph Theory), Mathematical Biology. Qualifying Exams in Matrix Analysis and Abstract Algebra.

Education

Mathematics 15 Graduate-Level Credit Hours: Teaching College Mathematics, Qualitative Research in Education I & II, Epistemology of Advanced Mathematical Concepts, Learning Theories in Collegiate Mathematics Education. Qualifying Exam in Collegiate Mathematics Education.

Statistics 6 Graduate-Level Credit Hours: Mathematical Statistics, Linear Statistical Analysis.

Data Science 5 Coursera Courses: Introduction to Data Science in Python, Applied Plotting, Charting & Data Representation in Python, Applied Machine Learning in Python, Applied Text Mining in Python, Applied Social Network Analysis in Python.