Darryl Chamberlain Jr.

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

2023–present **Associate Chair**, Department of Mathematics, Science, & Technology, Embry-Riddle Aeronautical University – Worldwide

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

External Research Funding Experience

$500 funded **Principal Investigator**, *Doenet (DUE-1915294, DUE-1915363, DUE-1915438) Learning Experiment Mini-Grant: Asycnchronous Discovery Activity - Learning to Fly with the Wind*, 2023-2024.

$382,578 funded **Co-Principal Investigator**, *NSF IUSE: Undergraduate Research for Fully Online STEM Students: 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 funded **Co-Principal Investigator**, *NSF IUSE: Community of Inquiry and Cognitive Load in Online STEM: Persistence, Performance, and Perspectives*, with Emily Faulconer (PI) and Beverly Wood (co-PI). 2021-2024.

$271,543 unfunded **Principal Investigator**, *NSF IUSE: Drilling Down into Concepts with Automatic and Diagnostic Item Generation (Auto-DIG)*, with Annie Burns-Childers (co-PI), Catherine Paolucci (co-PI), and Russell Jeter (consult). Submitted October 2020.

$202,184 unfunded **Co-Principal Investigator**, *NSF: Using Video to Expand Communication of Mathematical Sciences Research*, with Catherine Paolucci (PI). Submitted October 2020.

$99,960 unfunded **Principal Investigator**, *NSF ECR Core Research: Analyzing a Novel College Algebra Curriculum and Implementation*, with Russell Jeter (consult). Submitted October 2019.

$340,764 funded **Graduate Research Assistant (2016–2017); Other Professional (2017–present)**, *NSF IUSE: 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 funded **Principal Investigator**, *ERAU-W Faculty Seed Grant: Collective Knowledge Progression and Proliferation in Asynchronous Calculus Discussion Boards*, with Zackery Reed (co-PI) and Karen Keene (co-PI). 2023.

$4,069 funded **Principal Investigator**, *ERAU-W Faculty Seed Grant: Developing Autonomous, Targeted Feedback in Precalculus*, 2021-2022.

$29,923 funded **Co-Principal Investigator**, *UF Internal Grant: Examining and addressing the content knowledge 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, Omaha, NE.

[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 RUM, Boston, MA.

[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.

[1] Co-first authors.

[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.

[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*
- Asynchronous online with $10 - 20$ students.

2021–present **Precalculus for Aviation**, *Instructor*
- Asynchronous online with $20-30$ students.
- October 2022: EagleVision with 20 students.

2021–present **Precalculus Essentials**, *Instructor*
- Asynchronous online with $20-30$ students.

2018–2021 **Analytic Geometry and Calculus I**, *Instructor*
- Fall 2019, Fall 2020: Special flipped class for ∼15 Pre-Health PostBac students.
- Summer 2018: Special flipped classroom with ∼20 freshmen engineering students.
- Spring 2018: Large lecture with 200+ students.

Spring 2021 **Sets and Logic**, *Instructor*
- Modified Moore's Method with ∼30 students.

Summer 2019 **Analytic Geometry and Calculus II**, *Instructor*
- Flipped class with ∼20 students.

Spring 2019 **Elementary Differential Equations**, *Instructor*
- Large lecture with 120+ students.

2017–2021 **College Algebra**, *Developer/Coordinator/Instructor*
- Multiple sections of Pure Online (∼150 students) and Hyrbid (∼200 students) per semester.
- Curriculum overhaul with focus on understanding of functions.
- 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).
- 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 Mathematical Association of America Council on Teaching and Learning.

2022–present **Subcommittee Chair** for Mathematical 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–present **Grant Reviewer** for the National Science Foundation.

2017–present **Journal Reviewer** for
- *Educational Studies in Mathematics* since 2022;
- *Mathematical Thinking and Learning* since 2021;
- *International Journal of Research in Mathematics Education* since 2020;
- *Journal of Assessment in Higher Education* since 2019;
- *Journal of Mathematical Behavior* since 2017; and
- *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–present **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.

2022–2023 **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)
- 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**, Mathematical 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 15-18

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.*

Mathematics Education **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.