

JEFFREY M. FORD, Ph.D.

CURRICULUM VITAE

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Education

- Ph.D., Mathematics, Auburn University 2017
Dissertation: "Measure-preserving Dynamical Systems on \mathbb{R}^3 with all Trajectories Bounded."
Advisor: Dr. Krystyna Kuperberg
- M.A., Mathematics, Minnesota State University, Mankato 2011
Thesis: "A Duality Theory for the Algebraic Invariants of Substitution Tiling Spaces"
Advisor: Dr. Brian Martensen
- B.A., Geology, Gustavus Adolphus College 2002

Employment

- Visiting Assistant Professor, Department of Mathematics, Computer Science, & Statistics 2016–Present
Gustavus Adolphus College
- Graduate Teaching Assistant, Department of Mathematics 2013-2017
Auburn University
- Instructor, Department of Mathematics & Statistics 2011–2016
Minnesota State University, Mankato
- Graduate Teaching Assistant, Department of Mathematics & Statistics 2009-2011
Minnesota State University, Mankato

Teaching Experience

Courses Taught at Gustavus Adolphus College

- MCS 357 - Discrete Dynamical Systems
- MCS 353 - Continuous Dynamical Systems
- MCS 344 - Calculus on Manifolds
- MCS 332 - Topology
- MCS 321 - Theory of Complex Variables
- MCS 256 - Discrete Calculus
- MCS 222 - Multivariable Calculus
- MCS 221 - Linear Algebra
- MCS 220 - Introduction to Analysis
- MCS 213 - Introduction to Algebraic Structures
- MCS 177 - Computer Science I Lab
- MCS 150 - Discrete Mathematics
- MCS 125 - Tilings and Tessellations
- MCS 122 - Calculus II
- MCS 121 - Calculus I
- MCS 115 - Nature of Mathematics
- MCS 106 - Tabletop Game Design

Courses Taught at Minnesota State University - Mankato

- MATH 316 - Intermediate Analysis
- MATH 290 - Foundations of Mathematics
- MATH 201 - Mathematics for Elementary Education
- MATH 127 - Calculus II for Engineers
- MATH 122 - Calculus II
- MATH 121 - Calculus I
- MATH 112 - College Algebra
- MATH 110 - Perspectives in Mathematics
- MATH 098 - Intermediate Algebra
- MATH 096 - Summer Bridge Mathematics

Courses Taught at Auburn University (* indicates a course developed and taught online)

- MATH 1623 - Calculus II *
- MATH 1120 - Pre-Calculus Algebra
- MATH 1123 - Pre-Calculus *
- MATH 1003 - College Algebra *

Student Supervision

- Undergraduate honors research with Grace Kearney, Gustavus Adolphus College* Fall 2024-Spring 2025
Project studied fractal dimension of the Newton-Leipnick attractor
- Undergraduate honors research with Erin Coleman, Gustavus Adolphus College* Spring 2024-Spring 2025
Project studied topological structure of the basin boundary for the Newton-Leipnick dynamical system
- Independent Study with Sydney Koppelman* Fall 2023
Real Analysis
- Independent Study with Abigail Yartz* Fall 2022 - Spring 2023
Real Analysis
- Independent Study with Brandon Sisler* Spring 2022
Axiomatic set theory
- Independent Study with Sophia Nelson* Spring 2021
Topology of foliations
- Interdisciplinary undergraduate research with Sanjeeda Shutrishna, collaborating with Dr. Ian Cero, Department of Psychiatry, University of Rochester* Summer 2019
Project studied the evolution and prevalence of suicidal behavior in *E. coli* bacteria, and it's affect on long-term colonial resistance to pathogen attack.
- Interdisciplinary undergraduate research with Emilee Mason, collaborating with Dr. Dan Moos, Education Department, Gustavus Adolphus College* Spring 2019
Project studied the effect of active learning on improving student self-efficacy, and it's relationship to math anxiety.
- Undergraduate honors research with Charlie Moe, Gustavus Adolphus College* Spring 2018-Spring 2019
Project studied volume-preserving dynamical systems with bounded trajectories in \mathbb{R}^5 .
- Independent Study with Jacob Fry* Spring 2017 - Fall 2017
Axiomatic set theory
- Independent Study with Russel Krueger* Spring 2017
Ordinary differential equations
- Undergraduate research with Leah Lumley and Sarah Painter, Minnesota State University, Mankato* Spring 2012
Project studied mathematical models of musical arrangements.
- Interdisciplinary undergraduate research with Jessica Niesen, collaborating with Dr. Kristie Campana, Psychology Department, MSU - Mankato* Spring 2012
Project studied mathematical models of relationships between fame and other characteristics of popular musicians.
- Graduate research with Lindsay Stepan, Minnesota State University - Mankato* 2011-2012
Project involved investigating mastery of pre-algebra skills in incoming developmental algebra students.

Thesis committee membership for the following students:

- Erin Coleman, B.A. Mathematics with Honors, Gustavus Adolphus College, Spring 2025
- Grace Kearney B.A. Mathematics with Honors, Gustavus Adolphus College, Spring 2025
- Charlie Moe, B.A. Mathematics with Honors, Gustavus Adolphus College, Spring 2019
- Brittany Proethe, M.S. Psychology, Minnesota State University, Mankato, Spring 2016
- Glenn Trussel, M.S. Psychology, Minnesota State University, Mankato, Spring 2015

- Rebecca Targove, M.A. Mathematics, Minnesota State University, Mankato, Spring 2013
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Research

Area: Topological dynamics, mathematics education

Books

- "Encounters with Chaos and Fractals, 3rd Edition" (with D. Gullick)
Chapman and Hall/CRC (2024)
- "Linear Algebra for Team-based Inquiry Learning.", contributing author.
<https://library.tbil.org/2024/linear-algebra/>
- "Discovering Dynamical Systems through Experiment and Inquiry." (with T. LoFaro)
Chapman and Hall/CRC (2021)

Papers

- "Relating Consistent Improvement to Overall Performance in a Calculus I Course that Utilizes Standards-Based Grading" (with J. Downey, R. Erickson, H. Le, and K. Vick)
PRIMUS 34(8) (July 2024)
- "Encouraging Mastery Learning through Contract Grading" (with K. Campana)
Communicating Psychological Science (March 2020)
- "Blending Team-based Learning and Mastery Grading in the Calculus Classroom."
Mathematics Teaching and Research Journal **Vol. 10** no. 3-4, (Fall/Winter 2018)
- "Investigating Algebraic Procedures using Discussion and Writing" (with J. Harper)
Research and Teaching in Developmental Education **Vol. 28** no. 2, (April 2012)
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Invited Talks

- "Using Inquiry-Based Learning and Standards-Based Grading To Teach Differential Equations" (with T. LoFaro)
 Joint Mathematics Meeting, San Francisco, CA January 2024
- "Pointless Grading"
 Department of Mathematics and Statistics Colloquium, Minnesota State University - Mankato. March 2023
- "An introduction to Project-based Learning"
 Faculty workshop at Gustavus Adolphus College July 2022
- "Getting started with Mastery Grading."
 Undergraduate Research Center certificate program, Minnesota State University. October 2021
- "What is Mastery Grading, and why is it a good idea?"
 Center for Excellence in Teaching and Learning Seminar, Minnesota State University. March 2021
- "Using technology along with Mastery Grading to increase equity in education."
 Technology Roundtable, Minnesota State University. March 2021
- "Mastery Grading in the Online Classroom."
 Joint Mathematics Meeting January 2021
- "Table Talks: Getting started with Mastery Grading."
 Mastery Grading Conference, Online June 2020
- "A non-singular volume preserving dynamical system \mathbb{R}^3 , with all trajectories bounded."
 Mathematics Department Seminar, Minnesota State University. February 2019
- "Team-based learning and mastery grading in Universal Design"
 Teachers Talking Seminar, Gustavus Adolphus College February 2019
- "Standards-Based Grading: Tools and Tips for Successful Implementation"
 Project NExT Workshop, Joint Mathematics Meeting January 2019

"Tilings and Tiling Spaces." Department of Mathematics, Computer Science and Statistics Seminar, Gustavus Adolphus College.	October 2018
"Blending Team-based learning and Mastery grading in Calculus I." Mathematics Department Seminar, Brandeis University	September 2018
"A non-singular measured-foliation on \mathbb{R}^3 , with all leaves contained in bounded sets." Continuum Theory Seminar, Auburn University.	October 2017
"Volume-preserving dynamical systems and related foliations." Department of Mathematics, Computer Science and Statistics Seminar, Gustavus Adolphus College.	September 2017
"Counting Nimbers." Department of Mathematics, Computer Science and Statistics Seminar, Gustavus Adolphus College.	September 2016
"An introduction to continuum theory." Given over 4 weeks at the Department of Mathematics and Statistics Graduate Student Colloquium, Minnesota State University - Mankato.	January 2014
"An introduction to topological invariants." Department of Mathematics and Statistics Graduate Student Colloquium, Minnesota State University - Mankato.	November 2013
"Topology of tiling spaces, a semester seminar" Department of Mathematics and Statistics, Minnesota State University - Mankato.	Spring 2012

Conference Presentations

"Thinking about writing with peer evaluations" MAA-NCS Spring Section Meeting	March 2025
"Implementing Ungrading" The Grading Conference, Online	June 2024
"Hardy's Apology" MAA-NCS Spring Section Meeting	March 2024
"Grading System PR (Getting buy-in)"	
"Mastery grading to improve proof-writing in Linear Algebra" The Grading Conference, Online	June 2023
"Abandon all grades, ye who enter here" MAA-NCS Spring Section Meeting	March 2023
"Wait, you're not all Math Majors?" MAA-NCS Spring Section Meeting	April 2022
"Mastery grading to improve proof-writing in Linear Algebra" Mastery Grading Conference, Online	June 2020
"A Measure-Preserving PL modification of the Jones-Yorke bounded orbit flow on \mathbb{R}^3 ." (with K. Kuperberg) Dynamics, Equations, and Applications, Krakow, Poland	September 2019
"Changes to student self-efficacy and motivation with Team-Based Learning." MAA MathFest, Cincinnati, OH	August 2019
"Blending Team-based learning and Mastery grading in Calculus I." MAA MathFest Poster Session, Denver, CO	August 2018
"Getting Started with Team-based learning." (with B. Reimann) Celebration of Creative Inquiry, Gustavus Adolphus College, St. Peter, MN	April 2017

"A volume-preserving dynamical system on \mathbb{R}^3 with all trajectories bounded." 51st Spring Topology and Dynamical Systems Conference, New Jersey City, NJ	March 2017
"Visualizing the Wilson Plug" 30th Summer Conference on Topology and its Applications, Galway, Ireland	June 2015
"IBL teaching methods in an advanced class on Vietoris Homology" (with F. Sturm) Legacy of R.L. Moore Conference, Denver, CO	June 2014
"Maverick Comprehensive Learning Analytics and Support System (MavCLASS): Deep, Real World Learning Analytics to Enhance Student Success" (with J. Higdon-Topaz) Annual Gateway Course Experience Conference, Indianapolis, IN	March 2014
"Pre-algebra skills as a means of assessing readiness of developmental algebra students" (with L. Stepan) MNADE Fall Conference, Walker, MN	September 2013
"Duality for substitution tiling spaces" Graduate Research Conference, Minnesota State University-Mankato	April 2011
"Investigating Algebraic Procedures with Class Discussions and Student Journaling" (with J. Harper) MNADE Fall Conference, Grand Rapids, MN	September 2010

Professional Development and Service

<i>Editorial Board</i> Team-based Inquiry Learning Textbook Series	Fall 2024 - Present
<i>Leadership Team</i> Minnesota Inquiry Teaching Network Book Club	Spring 2022 - Present
<i>Participant</i> Little School Dynamics Colloquium (online research collaboration)	2021
<i>Natural Sciences Division Representative</i> College Curriculum Committee, Gustavus Adolphus College	2019-2021
<i>Participant</i> MAA Summer workshop on Inquiry-Based Learning.	June 2019
<i>Advisor</i> Mathematics, Computer Science, & Statistics Club, Gustavus Adolphus College.	2018-Present
<i>Program Assessment Liaison</i> Mathematics, Computer Science, & Statistics Department, Gustavus Adolphus College.	2016-2022
<i>Executive Committee Member</i> Midstates Consortium for Mathematics and Science.	2016-2021
<i>Library Liaison</i> Mathematics, Computer Science, & Statistics Department, Gustavus Adolphus College.	2017-2019
<i>New Faculty Orientation Tour Guide</i> Gustavus Adolphus College	2017-2019
<i>Organizer</i> Team-Based Learning Teaching Circle, Gustavus Adolphus College.	2016-2017
<i>Chair</i> Assessment Committee, Mathematics & Statistics Department, Minnesota State University - Mankato.	2013-2016
<i>Organizer</i> Graduate Colloquium. Graduate student Seminar, held weekly at Minnesota State University-Mankato.	2013-2016

<i>Organizer</i> Summer Conference on Topology and its Applications. Minnesota State University-Mankato.	July 2012
<i>Organizer</i> Mankato Area Math Circle for Students. Sponsored by MSRI-NCMC, held at Minnesota State University-Mankato.	2011-2012
<i>Organizer</i> Julia Robinson Mathematics Festival. Sponsored by MSRI, held at Minnesota State University-Mankato.	November 2011
<i>Volunteer instructor</i> GRE mathematics preparatory course, Minnesota State University-Mankato.	2009-2011

Honors and Awards

Winner of the Provost's Award for Teaching Excellence by a Non-tenure Track Faculty Member Gustavus Adolphus College	2023
Nominated for the Innovative Teaching Award, Gustavus Adolphus College	2017-2023
Nominated for the Provost's Award for Teaching Excellence by a Non-tenure Track Faculty Member Gustavus Adolphus College	2018-2022
Team-Based Inquiry Learning Fellowship, University of Southern Alabama	2021-2022
Awarded First-Year Research Experience (FYRE) internal grant, Gustavus Adolphus College	Summer 2019
Graduate Teaching Assistantship, Auburn University	2013-2017
Dr. Ben Fitzpatrick, Jr. Graduate Fellowship in Topology, Auburn University	2016
Awarded Research Reassigned Time (Course release from 4 credits of teaching) College of Science, Engineering, and Technology, Minnesota State University Mankato	Spring 2015
Outstanding Service Award, Academic and Student Affairs Division Minnesota State University Mankato,	2011-2012
Awarded Course Development Reassigned Time (Course release from 3 credits of Spring teaching) College Access Program, Minnesota State University Mankato	Spring 2012
Graduate Teaching Assistantship, Minnesota State University - Mankato	2009-2011
Presidential Scholarship Award, Gustavus Adolphus College	1998-2002
Partners in Scholarship Award, Gustavus Adolphus College	1998-2002
