

Matthew Ziemke

CONTACT INFORMATION	Iowa State University Department of Mathematics Carver Hall 411 Morrill Rd Ames, IA USA	Email: mziemke@iastate.edu Webpage: matt-ziemke.com
RESEARCH INTERESTS	Functional Analysis, Operator Algebras, Semigroups, Mathematical Physics	
EDUCATION	University of South Carolina , Columbia, SC	
	Ph.D., Mathematics, May 2015	
	• Dissertation Topic: <i>Pettis Integration with Applications to Generators of Quantum Markov Semigroups</i> • Advisor: George Androulakis	
	John Carroll University , University Heights, OH	
	M.S., Mathematics, May 2009	
	• Thesis Topic: <i>Solutions to Pell Equations</i> • Advisor: Leo Schneider	
	Ohio University , Athens, OH	
	B.S., Mathematics Education, March 2007	
	• Minor: History	
ACADEMIC CAREER	Assistant Teaching Professor in Advanced Undergraduate Mathematics Department of Mathematics, Iowa State University	Aug 2026 to present
	Associate Teaching Professor Department of Mathematics, Drexel University	Sept 2024 to Aug 2026
	Assistant Teaching Professor Department of Mathematics, Drexel University	Sept 2016 to August 2024
	Instructor Department of Mathematics, University of South Carolina	Aug 2015 to July 2016
	Teaching Assistant Department of Mathematics, University of South Carolina	Aug 2010 to May 2015
	Instructor Department of Mathematics, Northern Virginia Community College	Aug 2009 to May 2010

Graduate Assistant

Aug 2007 to May 2009

Department of Mathematics and Computer Science,
John Carroll University

PAPERS

1. *An elementary construction of the GKSL master equation for N-level open quantum systems*. Submitted.
2. With George Androulakis and Alex Wiedemann, *The induced semigroup of Schwarz maps to the space of Hilbert-Schmidt operators*, Math. Phys. Anal. Geom. 23, 10 (2020).
3. With George Androulakis, *The closedness of the generator of a semigroup*, Semigroup Forum 93 (2016), no. 3, 589-606.
4. With George Androulakis, *Generators of quantum Markov semigroups*, Journ. Math. Phys. 56 (2015), 083512.

BOOKS

1. *Understanding Topology: An Analytic Perspective*. Accepted for publication.
2. With George Androulakis, *Functional Analysis with step-by-step exercises*. To be published by World Scientific.

RESEARCH TALKS

1. Reading Seminar: Regular Points and Defect Numbers of Operators from the book, "Unbounded Self-adjoint Operators on Hilbert Space," by Konrad Schmudgen. Analysis Seminar. Drexel University. Winter 2026.
2. Generating quantum dynamical semigroups. Analysis Seminar. Drexel University. Spring 2025.
3. Reading Seminar: Abelian C^* -algebras and the Functional Calculus from the book, "A Course in Operator Theory," by John Conway. Analysis seminar. Drexel University. Winter 2024.
4. Reading Seminar: Properties of Spectrahedra from the book, "Geometry of Linear Matrix Inequalities," by T. Netzer and D. Plaumann. Analysis seminar. Drexel University. Winter 2023.
5. An elementary construction of the GKSL master equation for N-level open quantum systems. Analysis Seminar. Drexel University. Spring 2019.
6. Semigroups having an invariant faithful normal state. Analysis Seminar. Drexel University. Winter 2018.
7. On the form of the generator of a quantum Markov semigroup having a faithful normal invariant state. Analysis Seminar. University of South Carolina. Fall 2017.
8. Quantum Markov semigroups and their generators. Analysis Seminar. Drexel University. Winter 2017.
9. Generators of n -level systems in the Schrodinger picture. Analysis Seminar. University of South Carolina. Spring 2016.
10. Generators of quantum Markov semigroups. Virginia Operator Theory and Complex Analysis Meeting. Washington and Lee University. Fall 2015.

	11. The closedness of the generator of a semigroup. BIRS Workshop on Quantum Markov Semigroups and Quantum Probability. Casa Matematica Oaxaca in Oaxaca, Mexico. Summer 2015. 12. The closedness of generators of quantum Markov semigroups. Analysis Seminar. University of South Carolina. Spring 2015. 13. Generators of quantum Markov semigroups. Analysis Seminar. Texas A&M University. Summer 2014. 14. Generators of quantum dynamical semigroups. Analysis Seminar. University of South Carolina. Fall 2013. 15. A direct approach to the bounded Borel functional calculus for bounded normal operators. Analysis Seminar. University of South Carolina. Spring 2013.												
OUTREACH TALKS	1. An introduction to fractal geometry and the Mandelbrot set. Carolina Math Seminar. The Citadel. Fall 2012. 2. An introduction to the Mandelbrot set. Pi Mu Epsilon Meeting. University of South Carolina. Spring 2012.												
SUPPORTED PARTICIPATION	<table> <tr> <td>Virginia Operator Theory and Complex Analysis Meeting University of Richmond, Richmond, VA</td><td>Oct 2016</td></tr> <tr> <td>Virginia Operator Theory and Complex Analysis Meeting Washington and Lee University, Lexington, VA</td><td>Nov 2015</td></tr> <tr> <td>BIRS Workshop on Quantum Markov Semigroups and Quantum Probability Casa Matematica Oaxaca, Oaxaca, Mexico</td><td>Aug 2015</td></tr> <tr> <td>Virginia Operator Theory and Complex Analysis Meeting Washington and Lee University, Lexington, VA</td><td>Oct 2014</td></tr> <tr> <td>NSF Workshop in Analysis and Probability Texas A&M University, College Station, TX</td><td>July 2014</td></tr> <tr> <td>NSF Workshop in Analysis and Probability Texas A&M University, College Station, TX</td><td>Aug 2013</td></tr> </table>	Virginia Operator Theory and Complex Analysis Meeting University of Richmond, Richmond, VA	Oct 2016	Virginia Operator Theory and Complex Analysis Meeting Washington and Lee University, Lexington, VA	Nov 2015	BIRS Workshop on Quantum Markov Semigroups and Quantum Probability Casa Matematica Oaxaca, Oaxaca, Mexico	Aug 2015	Virginia Operator Theory and Complex Analysis Meeting Washington and Lee University, Lexington, VA	Oct 2014	NSF Workshop in Analysis and Probability Texas A&M University, College Station, TX	July 2014	NSF Workshop in Analysis and Probability Texas A&M University, College Station, TX	Aug 2013
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NSF Workshop in Analysis and Probability Texas A&M University, College Station, TX	July 2014												
NSF Workshop in Analysis and Probability Texas A&M University, College Station, TX	Aug 2013												
PH.D. COURSEWORK	Fourier Analysis, Littlewood-Paley Theory, Theory of Wavelets, Probability Theory, Non-Linear Approximation Theory, Functional Analysis II, Set Theoretic Topology, Linear Approximation Theory, Functional Analysis I, Stochastic Calculus, Real Analysis II, Algebra II, Transcendental Number Theory, Real Analysis I, Algebra I, Elementary Number Theory. GPA: 4.0												

TEACHING
EXPERIENCE

Drexel University, Philadelphia, PA

Responsible for lectures, exams, and grades.

• Math 200- Multivariate Calculus	Spring 2026
• Math 221- Discrete Mathematics	Spring 2026
• Math 210- Differential Equations	Winter 2026
• Math 123- Calculus III	Winter 2026
• Math 422- Topology	Fall 2025
• Math 210- Differential Equations	Fall 2025
• Math 122- Calculus II	Fall 2025
• Math 210- Differential Equations	Summer 2025
• Math 210- Differential Equations	Spring 2025
• Math 201- Linear Algebra	Spring 2025
• Math 402- Elements of Modern Analysis II	Winter 2025
• Math 210- Differential Equations	Winter 2025
• Math 122- Calculus II	Winter 2025
• Math 401- Elements of Modern Analysis I	Fall 2024
• Math 122- Calculus II	Fall 2024
• Math 239- Mathematics for the Life Sciences	Spring 2024
• Math 220- Introduction to Mathematical Reasoning	Spring 2024
• Math 123- Calculus III	Spring 2024
• Math 402- Elements of Modern Analysis II	Winter 2024
• Math 123- Calculus III	Winter 2024
• Math 122- Calculus II	Winter 2024
• Math 401- Elements of Modern Analysis I	Fall 2023
• Math 122- Calculus II	Fall 2023
• Math 116- Calculus and Functions	Fall 2023
• Math I399- Fractal Geometry	Summer 2023
• Math 221- Discrete Mathematics	Summer 2023
• Math 210- Differential Equations	Spring 2023
• Math 220- Introduction to Mathematical Reasoning	Spring 2023
• Math 402- Elements of Modern Analysis II	Winter 2023
• Math 210- Differential Equations	Winter 2023
• Math 401- Elements of Modern Analysis I	Fall 2022
• Math 121- Calculus I	Fall 2022
• Math I399- Measure Theory and Lebesgue Integration	Summer 2022
• Math 210- Differential Equations	Summer 2022
• Math 239- Mathematics for the Life Sciences	Spring 2022
• Math 220- Introduction to Mathematical Reasoning	Spring 2022
• Math 122- Calculus II	Spring 2022
• Math 210- Differential Equations	Winter 2022
• Math 402- Elements of Modern Analysis II	Winter 2022
• Math 121- Calculus I	Winter 2022
• Math 401- Elements of Modern Analysis I	Fall 2021
• Math 121- Calculus I	Fall 2021
• Math 221- Discrete Mathematics	Summer 2021
• Math 123- Calculus III	Spring 2021
• Math 201- Linear Algebra	Spring 2021
• Math 117- Calculus and Functions II	Winter 2021
• Math 116- Calculus and Functions I	Winter 2021
• Math 101- Introduction to Analysis I	Winter 2021
• Math 121- Calculus I	Fall 2020
• Math 311- Probability and Statistics I	Spring 2020
• Math 239- Mathematics for the Life Sciences	Spring 2020

• Math 402- Elements of Modern Analysis II	Winter 2020
• Math 210- Differential Equations	Winter 2020
• Math 401- Elements of Modern Analysis I	Fall 2019
• Math 201- Linear Algebra	Fall 2019
• Math 221- Discrete Mathematics	Summer 2019
• Math 220- Introduction to Mathematical Reasoning	Spring 2019
• Math 122- Calculus II	Spring 2019
• Math 239- Mathematics for the Life Sciences	Winter 2019
• Math 220- Introduction to Mathematical Reasoning	Winter 2019
• Math 239- Mathematics for the Life Sciences	Fall 2018
• Math 123- Calculus III	Fall 2018
• Math 122- Calculus II	Fall 2018
• Math 239- Mathematics for the Life Sciences	Spring 2018
• Math 221- Discrete Mathematics	Spring 2018
• Math 110- Precalculus	Spring 2018
• Math 117- Calculus and Functions II	Winter 2018
• Math 239- Mathematics for the Life Sciences	Fall 2017
• Math 116- Calculus and Functions	Fall 2017
• Math 221- Discrete Mathematics	Summer 2017
• Math 122- Calculus II	Summer 2017
• Math 221- Discrete Mathematics	Spring 2017
• Math 123- Calculus III	Spring 2017
• Math 221- Discrete Mathematics	Winter 2017
• Math 122- Calculus II	Winter 2017
• Math 123- Calculus III	Fall 2016
• Math 200- Multivariate Calculus	Fall 2016

University of South Carolina, Columbia, SC

Responsible for lectures, exams, and grades.

• Math 242- Elementary Differential Equations	Summer 2016
• Math 242- Elementary Differential Equations	Spring 2016
• Math 142- Calculus II	Spring 2016
• Math 242- Elementary Differential Equations	Fall 2015
• Math 241- Vector Calculus	Fall 2015
• Math 122- Business Calculus	Fall 2015
• Math 544- Linear Algebra	Summer 2015
• Math 241- Vector Calculus	Spring 2015
• Math 170- Finite Mathematics	Fall 2014
• Math 546- Algebraic Structures I	Summer 2014
• Math 242- Elementary Differential Equations	Spring 2014
• Math 111- College Algebra	Fall 2013
• Math 241- Vector Calculus	Summer 2013
• Math 122- Business Calculus	Spring 2013
• Math 142- Calculus II	Fall 2012
• Math 242- Elementary Differential Equations	Summer 2012
• Math 141- Calculus I	Spring 2012
• Math 115- Precalculus	Fall 2011
• Math 242- Elementary Differential Equations	Summer 2011
• Math 111- College Algebra	Spring 2011

Northern Virginia Community College, Annandale, VA

Responsible for lectures, exams, and grades.

• MT 200- Abstract Algebra	Spring 2010
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- MT 166- Precalculus with Trigonometry Spring 2010
- MT 152H- Honors Math for the Liberal Arts II Spring 2010
- MT 152- Math for the Liberal Arts II Spring 2010
- MT 151- Math for the Liberal Arts I Spring 2010
- MT 151- Math for the Liberal Arts I Fall 2009
- MT 004- Algebra II Fall 2009

SERVICE

University Service

- Standing Committee for Artificial Intelligence, Drexel University
2023-2026

Department Service

- Diversity, Equity, Inclusion Committee member, Drexel University
2023-2025
- Award Committee member, Drexel University
2022-2025
- Assessment Coordinator, Drexel University
2022-2023
- Undergraduate Program Committee member, Drexel University
2017-2018, 2019-2021, 2022-2023, 2025-2026
- Remote Teaching Help Committee member, Drexel University
2020-2021
- Undergraduate Recruitment Committee member, Drexel University
2017-2018, 2021-2022
- Math 116 (Calculus and Functions I) Course Co-Coordinator, Drexel University
Fall 2017
- Math 117 (Calculus and Functions II) Course Co-Coordinator, Drexel University
Winter 2018
- Math 122 (Calculus II) Course Co-Coordinator, Drexel University
Spring 2019
- Math 239 (Mathematics for the Life Sciences) Course Coordinator, Drexel University
Spring 2020
- Math 121 (Calculus I) Course Co-Coordinator, Drexel University
Fall 2020
- Math 121 (Calculus I) Course Co-Coordinator, Drexel University
Fall 2021

PH.D. COMMITTEE

George Androulakis (advisor), Stephen Dilworth (math), Pencho Petrushev (math), Peter Nykos (math), Yuriy Pershin (physics)