Matthew Ziemke

CONTACT INFORMATION

Drexel University
Department of Mathematics
Korman Center
15 S. 33rd Street
Philadelphia, PA USA

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Webpage: math.drexel.edu/faculty/mjz55

RESEARCH INTERESTS

Functional Analysis, Operator Algebas, Semigroups, Mathematical Physics

EDUCATION

University of South Carolina, Columbia, SC

Ph.D., Mathematics, May 2015

- Dissertation Topic: *Pettis Integration with Applications to Generators of Quantum Markov Semigroups*
- Advisor: George Androulakis

John Carroll University, University Heights, OH

M.S., Mathematics, May 2009

- Thesis Topic: *Solutions to Pell Equations*
- Advisor: Leo Schneider

Ohio University, Athens, OH

B.S., Mathematics Education, March 2007

ACADEMIC CAREER

Assistant Teaching Professor — Sept 2016 to present
Department of Mathematics,
Drexel University

Instructor — Aug 2015 to July 2016
Department of Mathematics,
University of South Carolina

Teaching Assistant — Aug 2010 to May 2015
Department of Mathematics,
University of South Carolina

Instructor — Aug 2009 to May 2010
Department of Mathematics,
Northern Virginia Community College

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.* In preparation.
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. With George Androulakis, *A Course in Functional Analysis: A Modified Moore Approach*. In preparation.

Research Talks

1. An elementary construction of the GKSL master equation for N-level open quantum systems. Analysis Seminar. Drexel University. Spring 2019.

2. Semigroups having an invariant faithful normal state. Analysis Seminar. Drexel University. Winter 2018.

3. 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.

4. Quantum Markov semigroups and their generators. Analysis Seminar. Drexel University. Winter 2017.

5. Generators of n-level systems in the Schrodinger picture. Analysis Seminar. University of South Carolina. Spring 2016.

6. Generators of quantum Markov semigroups. Virginia Operator Theory and Complex Analysis Meeting. Washington and Lee University. Fall 2015.

7. 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.

8. The closedness of generators of quantum Markov semigroups. Analysis Seminar. University of South Carolina. Spring 2015.

9. Generators of quantum Markov semigroups. Analysis Seminar. Texas A&M University. Summer 2014.

10. Generators of quantum Dynamical semigroups. Analysis Seminar. University of South Carolina. Fall 2013.

11. 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

Virginia Operator Theory and Complex Analysis Meeting — Oct 2016
University of Richmond,
Richmond, VA

Virginia Operator Theory and Complex Analysis Meeting — Nov 2015
Washington and Lee University,
Lexington, VA

BIRS Workshop on Quantum Markov Semigroups and Quantum Probability — Aug 2015
Casa Matematica Oaxaca,
Oaxaca, Mexico

Virginia Operator Theory and Complex Analysis Meeting — Oct 2014
Washington and Lee University,
Lexington, VA

NSF Workshop in Analysis and Probability — July 2014
Texas A&M University,
College Station, TX

NSF Workshop in Analysis and Probability — Aug 2013
Texas A&M University,
College Station, TX

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 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 — 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
- 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

Drexel University, Philadelphia, PA

- Diversity, Equity, Inclusion Committee member, Drexel University
  2023-2024
- Assessment Coordinator, Drexel University
  2022-2023
- Award Committee member, Drexel University
  2022-2024
- Undergraduate Program Committee member, Drexel University
  2017-2018, 2019-2021, 2022-2023
- 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)