

Matthew P. Neal

Professor of Mathematics and Data Analytics
Departments of Mathematics and Data Analytics
Denison University
Granville, OH
(740) 587-6288
nealm@denison.edu
<http://personal.denison.edu/~nealm/>

Education

- Doctor of Philosophy, Mathematics, University of Virginia, January 1999 supervised by Dr. Kevin McCrimmon
- Studied under Dr. Martin Edwards at Queens College, University of Oxford, England, April 1998-August 1998
- Bachelor of Arts, Mathematics, Cum Laude, University of Virginia, May 1994
- Bachelor of Arts, History, University of Virginia, May 1994
- Phi Beta Kappa, May 1994

Employment and Teaching Experience

- Professor of Mathematics and Computer Science, Denison University, Fall 2014-
Calculus I (5 times), Multivariable Calculus (16 times), Mathematical Modeling (12 times), Technical Communication (5 times), Introduction to Data Analytics (5 times), Applied Statistics (12 times), Applied Probability, Advanced Linear Algebra, Vector Calculus and Fourier Analysis (once), Data Analytics in Industry (once)
- Associate Professor of Mathematics and Computer Science, Denison University, Fall 2008-Spring 2014

Calculus I for majors (8 times), Calculus I for non majors (3 times), Calculus II (6 times), Calculus III, Vector Calculus (twice), Fourier Analysis (3 times), Applied Math, Linear algebra (5 times), Introduction to Proofs (3 times) Abstract algebra (3 times), Advanced Analysis I, Advanced Analysis II, introductory Statistics (3 times), Intermediate Statistics (3 times), Advanced Statistics, Differential Equations (4 times), Probability, Mathematical Analysis in Sports, Mathematical Modeling (3 times),
- Assistant Professor of Mathematics and Computer Science, Denison University, Fall 2001- Spring 2007
- Visiting Assistant Professor, University of California, Irvine, Fall 1999-Spring 2001
Statistics (2 times), Calculus II (2 times), Differential Equations (2 times), Precalculus (3 times), Linear Algebra
- Instructor and graduate instructor, University of Virginia, Fall 1994-Spring 1999
10 courses, 6 recitations. Calculus I, Calculus II, Calculus III, Non-Majors Statistics, Non-Majors Probability, Abstract Algebra

Research Grants/Awards

- NSF grant # 0101153 June 2001 to June 2003
- Bartlett pre-tenure leave fellow, Denison University, 2005
- C. Goode Faculty Fellowship 2007-2008
- PIC Math NSF Grant DMS-1345499, CFDA No. 47.049, May 2015
- George R. Stibitz Distinguished Professor of Mathematics Chair, Denison University, 2016
- Brickman Award for Teaching Excellence, Denison University, 2021

Professional Service

- Reviewer for American Mathematical Society
- Regular reviewer for over 15 research journals.

Selected Professional Service for Denison University

- Teaching Evaluation Task Force Fall 2022 -Spring 2025
- Senior Advisory Review Board Fall 2022-Spring 2025
- Chair, Department of Mathematics, Denison University, fall 2020 - spring 2021
- Campus Affairs Counsel 2019 -2021
- General Education Competency Committee 2019-2020
- Faculty sponsor, Denison Christian Community, 2012 -
- Data Analytics Program Committee, spring 2016 -
- Chair, Religious Life Advisory Board, fall 2015 -2021
- President's Advisory board, Denison University, fall 2012 -spring 2014
- Chair, Department of Mathematics and Computer science, Denison University, fall 2009 - spring 2012
- Senior Administrative Review Committee, Denison University, fall 2008 - spring 2009
- Finance Committee, Denison University, fall 2008- spring 2009
- Personell Committee, Denison University, fall 2003 - spring 2006, chair fall 2005 - spring 2006
- Assessment coordinator, Department of Mathematics and Computer science, fall 2002 -

Publications

- Applied Calculus Textbook (in preparation 2025)
- M-ideals in Operator Algebras (with A. Peralta, S. Su., and D. Blecher) to appear Mathematische Nachrichten 2025
- M-ideals, Yet Again, the Case of real JB^* -triples (with A. Peralta, S. Su., and D. Blecher) to appear RACSAM, 2025
- Contractive Projections and Real Positive Maps on Operator Algebras (with D. Blecher), Studia Math, 256(1) (2021), 21-60
- Non-commutative Topology and Jordan Operator Algebras (with D. Blecher), Mathematische Nachrichten, 292, Issue 3, (2019), 481-510.
- Completely Contractive Projections on Operator Algebras (with D. Blecher), Pacific J. Math. 283 (2016), 289-324
- A holomorphic characterization of operator algebras (with B. Russo), Math. Scand. Vol 115, No 2 (2014), (229-268).
- Metric characterizations II (with D. Blecher), Illinois J. Math. Volume 57, Number 1 (2013), 25-41.
- Open projections in operator algebras II: compact projections. Studia Mathematica (with D. Blecher), **209** (2012), 203-224
- Open projections in operator algebras I: comparison theory (with D. Blecher), Studia Mathematica **208** (2012), 117-150
- Metric characterizations of isometries and of unital operator spaces and systems (with D. Blecher), Proceedings of the American Mathematical Society **139** (2011), 985-998.

- Existence of contractive projections on preduals of JBW*-triples (with B. Russo), *Israeli Journal of Mathematics* **182** (2011), 293-331
- Hereditary subalgebras of operator algebras (with D. Blecher and D. May), *Journal of Operator Theory* **59:2** (2008), 333-357
- Open partial isometries and positivity in operator spaces (with D. Blecher), *Studia Mathematica* **182** (2007), 227-262. (accepted July 2007)
- Ordered involutive operator spaces (with D. P. Blecher, K. Kirkpatrick, and W. Werner), *Positivity* **11** (2007), 497-510. (accepted April 2007)
- Classification of contractively complemented Hilbertian operator spaces (with B. Russo and E. Ricard), *Journal of Functional Analysis* **237** (2006), 589-616
- Representation of contractively complemented Hilbertian operator spaces on the Fock space (with B. Russo), *Proceedings of the American Mathematical Society* **134**, No. 2, (2005), 475-485
- State spaces of JB*-triples (with B. Russo), *Mathematice Annalen* **328** (2004), 585-624
- Normal contractive projections preserve type (with C.H. Chu and B. Russo), *Journal of Operator Theory* **51** (2004), 281-301
- Contractive projections and operator spaces (with B. Russo), *Transactions of the American Mathematical Society* Vol. 355 No.6 (2003), 2223-2262
- Operator space characterizations of C*-algebras and ternary rings (with B. Russo), *Pacific Journal of Mathematics* Vol. 209, No. 2, (2003), 339-364
- Spectrum preserving maps on JBW*-triples, *Archiv der Math.*, **79** (2002), p.258-267
- Projecteurs contractifs et espaces operateurs, (with B. Russo) *C. R. Acad. Sci. Paris, t. 331, Serie I* (2000), 873-878
- Inner ideals and facial structure of the quasi-state space of a JB-algebra, *Journal of Functional Analysis* **173** No. 2 (2000), 284-307,
- Ph. D. dissertation, Facial Structure in JB- algebras and their dual spaces, University of Virginia, (1999).

Research Presentations

- Invited Speaker, "Geometric and Metric-Linear Characterizations of Algebraic properties," International Workshop on Operator Theory and Applications, University of Kent, August, 2024
- Invited Speaker, "Geometric and Metric-Linear Characterizations of Algebraic properties," University of Houston, May, 2024
- Invited Speaker, "Non -commutative topology, positivity, and projections for non self-adjoint operator algebras", Operators on Hilbert spaces in Ohio annual conference", April 2018.
- Speaker (with Ben Brown), "Predictive modeling, unsupervised learning, and synergy for NBA players", Midwest Sports Analytics Meeting, Center College, November 2017
- Speaker, "Predictive modeling, unsupervised learning, and synergy for NBA players", Virginia Sports Analytics Meeting, Roanoke College, September 2017
- Invited speaker "Metric linear and holomorphic characterizations of operator algebra structures", USA-Uzbekistan Conference on Analysis and Mathematical Physics, University of California, Fullerton June 2014
- Speaker "Metric linear and holomorphic characterizations of operator algebra structures", GPOTS Conference, University of Houston May 2012
- Invited Speaker "Metric linear and holomorphic characterizations of operator algebra structures" Jordan Theory, Analysis and Related Topics Conference, Hong Kong, China, April 2012

- Invited Speaker “Metric linear and holomorphic characterizations of operator algebra structures“ American Mathematical Society/SouthAfrican Maths Society satellite conference on Abstract Analysis. University of Pretoria, South Africa, November 2011
- Invited Speaker “Geometric structure of TRO’s, operator algebras, and operator spaces” Jordan Colloquium at National Tsing Hua University, Hsinchu Taiwan, April 2010
- Invited speaker “JB*-triples in Banach space theory and operator space theory”, University of Virginia Operator Theory Seminar March 2009
- Invited speaker “JB*-triples in Banach space theory and operator space theory”, Workshop on Jordan structures in Analysis and Operator space theory, Granada, Spain, November 2008
- Speaker, “A solution to the generalized contractive projection problem ”, GPOTS Conference, University of Cincinnati, June 2008
- Invited Speaker “A solution to the generalized contractive projection problem ”, University of Houston, April 2008
- Invited Speaker “Classification of contractively complemented Hilbertian operator spaces”, University of California at Irvine, August 2007
- Invited Speaker, “An operator space classification of contractively complemented operator spaces”, Functional Analysis Seminar, University of Houston, August 2005.
- Speaker, “An operator space classification of contractively complemented operator spaces”, Workshop on operator spaces, operator algebras, and non-commutative probability, Universite Franche-Compte, June 2005
- Invited Speaker, “Contractively complemented operator spaces and fermions”, Functional Analysis seminar, University of California at Irvine, February 2005.
- Speaker, “Representations of contractively complemented operator spaces on the Fock space”, GPOTS Conference, Texas A&M, May 2004.
- Invited Speaker, “JB*-triples in operator space theory”, SUMIFRAS, Texas A&M University, August 2003.
- Speaker, “An affine operator space characterization of TRO’s and left ideals of C*-algebras”, Banach Algebras Conference, University of Alberta, July 2003.
- Speaker, “An affine operator space characterization of TRO’s and left ideals of C*-algebras”, GPOTS Conference, University of Illinois, May 2003.
- Speaker, “Contractive projections, holomorphy, and facial geometry in operator space and operator algebra theory”, Wabash Miniconference, IUPUI, September 2002.
- Invited Speaker, “The role of ternary products in analysis”, Mathematics colloquium, University of Miami, OH April 2002
- Speaker, “An operator space characterization of TRO’s and C*-algebras”, Regional AMS meetings, Irvine, CA, November 2001
- Invited Speaker, “On the classification of mixed injectives”, University of Texas, Austin, July 2001
- Speaker, “An operator space characterization of TRO’s”, GPOTS Conference, University of New Hampshire, June 2001
- Invited Speaker, “Contractive projections in operator space theory”, special session for operator algebras, Regional AMS meetings, San Francisco, October 2000
- Invited Speaker, “Contractive projections in operator space theory”, Conference on Jordan theory at Oberwolfach, Germany, August 2000
- Speaker, “Contractive projections in operator space theory”, Great Plains Operator Theory Conference, Puerto Rico, May 2000
- Speaker, “Spectrum preserving maps on JBW*-triples”, special session for Jordan theory, AMS joint meetings, Washington, D.C. January 2000
- Invited Speaker, “Facial structure in JB-algebras”, Functional Analysis Seminar, Oxford University, July 1998

Other Pedagogical, Expository, or General Audience Presentations

- , invited Speaker “Ruining Sports with Math”, Cincinnati Denison Alumni meeting, July 2014
- , invited Speaker “Ruining Sports with Math”, Sinclair community college, March 2013
- Invited Speaker “Ruining Sports with Math”, Ohio sectional meeting of the MAA, October 2012
- Invited Speaker, “Ruining Baseball with Math” Denison’s Alumni Reunion Weekend (June 2011, June 2006, June 2005), UERPA’s summer retreat (May 2005)
- Invited Speaker, ”Algebraanalysisology”, 4 college lecture series, Kenyon College, April 2011
- Speaker “Ruining Baseball with Math”, Denison’s Tuesday lunch series (October 2003, November 2009 and February 2015), Denison Mathematics and Computer Science DepartmentFast Talk Series (Fall 2003)
- Invited Speaker, “Ruining Baseball with Math”, Denison alumni events in Cincinnati (May 2006, May 2014) and Los Angeles (June 2004).
- Speaker, ”Noncommutative Mathematics”, Denison Scientific Association, March 2003