

GRETCHEN L. MATTHEWS

Associate Professor
Department of Mathematical Sciences
Clemson University
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EDUCATION

Ph.D., Louisiana State University, 1999, Mathematics
M.S., Louisiana State University, 1997, Mathematics
B.S., Oklahoma State University, 1995, Mathematics

PROFESSIONAL EXPERIENCE

Clemson University, 2007-, Associate Professor of Mathematical Sciences
Clemson University, 2001-2007, Assistant Professor of Mathematical Sciences
University of Tennessee, 1999-2001, Visiting Assistant Professor of Mathematics/
Postdoctoral position in Algebra
Louisiana State University, 1998-1999, Instructor of Mathematics

MEMBERSHIPS

Member, American Mathematical Society, AMS (1992-)
Member, Association for Women in Mathematics, AWM (1994-)
Senior Member, IEEE (2011-)
Member, IEEE Information Theory Society, (2000-)

PROFESSIONAL ACTIVITIES

Association for Women in Mathematics, Member, Long-range Planning Committee
(national) (2001-2004)

PUBLICATIONS

Books and chapters

1. J. L. Kim and G. L. Matthews, "Quantum error-correcting codes from algebraic curves," in *Advances in Algebraic Geometry Codes*, Series on Coding Theory and Cryptology (World Scientific, 2008), vol. 5; E. Martinez-Moro, C. Munuera, and D. Ruano, eds.; 419-444.

Refereed journal publications

1. W. Kositwattanarerk and G. L. Matthews, "Pseudocodewords of ternary parity-codes," in preparation, preprint available.
2. G. L. Matthews and J. D. Peachey, "Explicit bases for Riemann-Roch spaces of the extended norm-trace function field, with applications to AG codes and Weierstrass semigroups," in preparation, preprint available.
3. G. L. Matthews and J. D. Peachey, "Small bias sets from extended norm-trace codes," in review.

Refereed journal publications (continued)

4. W. Kositwattanarek and G. L. Matthews, "Lifting the fundamental cone and enumerating the pseudocodewords of a parity-check code," *IEEE Transactions on Information Theory* (Special issue on "Facets of Coding Theory: From Algorithms to Networks") **57** (2011), no. 2, 898-909.
5. N. Drake and G. L. Matthews, "Minimum distance decoding of general algebraic geometry codes via lists," *IEEE Transactions on Information Theory* **56** (2010), no. 9, 4335-4340.
6. G. L. Matthews and J. D. Peachey, "Minimal generating sets of Weierstrass semigroups of certain m-tuples on the norm-trace function field," *Contemporary Mathematics* **518** (2010), 315-326.
7. N. Drake and G. L. Matthews, "Parameter choices and a better bound on the list size in the Guruswami-Sudan algorithm for algebraic geometry codes," *Designs, Codes, and Cryptography* **54** (2010), no. 2, 181-187.
8. G. L. Matthews, "On Weierstrass semigroups of some triples on norm-trace curves," *Lecture Notes in Computer Science* **5557** (2009), 146-156.
9. G. L. Matthews, "Viewing multipoint codes as subcodes of one-point codes," *Grobner Bases, Coding, and Cryptography*, RISC Book Series (Springer, 2009), 399-402.
10. G. L. Matthews, "Frobenius numbers of generalized Fibonacci semigroups," *Combinatorial Number Theory*, 117-124, *de Gruyter, Berlin*, 2009.
11. R. C. Laskar, G. L. Matthews, B. Novick and J. Villalpando, "On irreducible no-hole $L(2,1)$ coloring of trees," *Networks* **53** (2009), no. 2, 206-211.
12. R. E. Jamison and G. L. Matthews, "On the acyclic chromatic number of Hamming graphs," *Graphs and Combinatorics* **24** (2008), 349-360.
13. R. E. Jamison and G. L. Matthews, "Acyclic colorings of products of cycles," *Bulletin of the Institute of Combinatorics and its Applications* **54** (2008), 59-76.
14. G. L. Matthews and R. S. Robinson, "A variant of the Frobenius problem and generalized Suzuki semigroups," *Combinatorial Number Theory*, 363-369, *de Gruyter, Berlin*, 2007.
15. R. E. Jamison, G. L. Matthews, and J. Villalpando, "Acyclic colorings of products of trees," *Information Processing Letters* **99** (2006), no. 1, 7-12.
16. H. Maharaj and G. L. Matthews, "On the floor and the ceiling of a divisor," *Finite Fields and their Applications* **12** (2006), no. 1, 38-55.
17. M. A. Coleman, N. Drake, and G. L. Matthews, "Codes from a quotient of the Hermitian curve attaining the designed distance," *Congressus Numerantium* **182** (2006), 161-170.
18. R. E. Jamison and G. L. Matthews, "Distance k colorings of Hamming graphs," *Congressus Numerantium* **183** (2006), 193-202.
19. G. L. Matthews, "Weierstrass semigroups and codes from a quotient of the Hermitian curve," *Designs, Codes and Cryptography* **37** (2005), no. 3, 473-492.
20. G. L. Matthews and T. W. Michel, "One-point codes using places of higher degree," *IEEE Transactions on Information Theory* **51** (2005), no. 4, 1590-1593.
21. G. L. Matthews, "On integers nonrepresentable by a generalized arithmetic progression," *Topics in Combinatorial Number Theory*, DIMITIA ITI 261, 2005, 143-148.

Refereed journal publications (continued)

22. G. L. Matthews, "Some computational tools for estimating the parameters of an algebraic geometry code," *Contemporary Mathematics* **381** (2005), 119-126.
23. H. Maharaj, G. L. Matthews, and G. Pirsic, "Riemann-Roch spaces for the Hermitian curve with applications to algebraic geometry codes and low-discrepancy sequences," *Journal of Pure and Applied Algebra* **195** (2005), 261-280.
24. G. L. Matthews, "Codes from the Suzuki function field," *IEEE Transactions on Information Theory* **50** (2004), no. 12, 3298-3302.
25. G. L. Matthews, "On numerical semigroups generated by generalized arithmetic sequences," *Communications in Algebra* **32** (2004), no. 9, 3459-3469.
26. G. L. Matthews, "The Weierstrass semigroup of an m -tuple of collinear points on a Hermitian curve," *Lecture Notes in Computer Science* **2948** (2004), 12-24.
27. D. E. Dobbs and G. L. Matthews, "On a question of Wilf concerning numerical semigroups," *International Journal of Commutative Rings* **2** (2003), no. 4, 195-204.
28. G. L. Matthews, "On triply-generated telescopic semigroups and chains of semigroups," *Congressus Numerantium* **154** (2002), 117-123.
29. D. E. Dobbs and G. L. Matthews, "On comparing two chains of numerical semigroups and detecting Arf semigroups," *Semigroup Forum* **63** (2001), no. 2, 237-246.
30. G. L. Matthews, "Weierstrass pairs and minimum distance of Goppa codes," *Designs, Codes and Cryptography* **22** (2001), no. 2, 107-121.

Invited conference presentations

1. G. L. Matthews, TBD, Special Session on Mathematical Coding Theory in Industrial Applications, AMS Western Section Meeting, Honolulu, HI (March 2012).
2. W. Kositwattanakorn and G. L. Matthews, "On enumerating the pseudocodewords of parity-check codes," Special Session on Coding Theory, AMS Central Section Meeting, Lincoln, NE (October 2011).
3. G. L. Matthews, "Small bias sets from extended norm-trace codes," Tenth International Conference on Finite Fields and Applications, Ghent, Belgium (July 2011).
4. G. L. Matthews and J. Peachey, "On Weierstrass semigroups arising from finite graphs," Special Session on Discrete Dynamical Systems in Graph Theory, Combinatorics, and Geometry, AMS Western Section Meeting, Las Vegas, NV (April 2011).
5. W. Kositwattanakorn and G. L. Matthews, "Iterative error correction for codes on graphs," Special Session on Discrete Dynamical Systems in Graph Theory, Combinatorics, and Geometry, AMS Western Section Meeting, Las Vegas, NV (April 2011).
6. G. L. Matthews, "Pseudocodewords and Tanner graph representation," Special Session on Advances in Algebraic Coding Theory, AMS Southeastern Section Meeting, Lexington, KY (March 2010).

Invited conference presentations (continued)

7. G. L. Matthews, "Pseudocodewords via a lifted fundamental cone," plenary talk at Combinatexas, San Marcos, TX (April 2010).
8. W. Kositwattanarerk and G. L. Matthews, "Pseudocodewords and Tanner graph representation," Special Session on Advances in Algebraic Coding Theory, AMS Southeastern Section Meeting, Lexington, KY (March 2010).
9. G. L. Matthews and J. D. Peachey, "Riemann-Roch spaces of the norm-trace function field," Special Session on Function Fields and their Applications, AMS Eastern Section Meeting, University Park, PA (October 2009).
10. G. L. Matthews, "On graphs and codes," Special Session on Graph Theory, AMS Southeastern Section Meeting, Huntsville, AL (October 2008).
11. N. Drake and G. L. Matthews, "On list decoding of algebraic geometry codes over rings," Special Session on Linear Codes over Rings and Modules, AMS Central Section Meeting, Kalamazoo, MI (October 2008).
12. G. L. Matthews, "Decoding one-point codes defined using places of higher degree," Mathematical Theory of Networks and Systems, Blacksburg, VA (August 2008).
13. G. L. Matthews, "On quantum codes from multipoint AG codes," Special Session on Algebraic Aspects of Coding Theory at AMS Central Section Meeting, Bloomington, IN (April 2008)
14. G. L. Matthews, "Fibonacci semigroups and their duals," Special Session on the Linear Diophantine Problem of Frobenius at Joint Mathematics Meetings, San Diego, CA (January 2008).
15. G. L. Matthews, "Acyclic colorings of Hamming graphs," Special Session on Graph Theory at AMS Southeastern Section Meeting, Murfreesboro, TN (November 2007).
16. G. L. Matthews, "Frobenius numbers of generalized Fibonacci semigroups," Integers Conference 2007, Carrollton, GA (October 2007).
17. G. L. Matthews, "Partial permutation decoding of Hermitian codes," Special Session on Algebraic Coding Theory honoring the retirement of Harold N. Ward at AMS Central Section Meeting, Chicago, IL (October 2007).
18. G. L. Matthews, "Automorphisms, isomorphisms, and algebraic geometry codes," Special Session on Applicable Algebra at AMS Southeastern Section Meeting, Davidson, NC (March 2007).
19. G. L. Matthews, "An approach to decoding Hermitian codes," Special Session on Algebraic Coding Theory honoring the retirement of Vera Pless at AMS Central Section Meeting, Cincinnati, OH (October 2006).
20. G. L. Matthews, "Codes from field extensions," AMS Special Session on Field Extensions at Joint Mathematics Meetings, San Antonio, TX (January 2006).
21. G. L. Matthews and R. S. Robinson, "A variant of the Frobenius problem and generalized Suzuki semigroups," Integers Conference 2005, Carrollton, GA (October 2005).
22. G. L. Matthews and T. W. Michel, "One-point codes using points of higher degree," Special Session in Algebraic Coding Theory at AMS Central Section Meeting, Athens, OH (March 2004).

Invited conference presentations (continued)

23. G. L. Matthews, "On numerical semigroups generated by generalized arithmetic sequences," Integers Conference 2003, Carrollton, GA (October 2003).
24. G. L. Matthews, "Weierstrass semigroups and codes from a class of maximal non-classical curves," Special Session in Applications of Number Theory and Algebraic Geometry to Coding at AMS Joint Central and Western Section Meeting, Boulder, CO (October 2003).
25. G. L. Matthews, "Some simple tools for analyzing algebraic geometry codes," Plenary talk at Conference on Coding Theory and Quantum Computing, Charlottesville, VA (May 2003).
26. G. L. Matthews, "Minimum distances of some Hermitian codes," AMS Special Session in Algebraic Coding Theory at Joint Mathematics Meetings, San Diego, CA (January 2002).
27. G. L. Matthews, "Gap sets and error-correcting codes," AWM Workshop at Joint Mathematics Meetings, New Orleans, LA (January 2001).
28. G. L. Matthews, "The Weierstrass gap set of an m -tuple and minimum distance of associated Goppa codes," Special Session in Algebraic Coding Theory at AMS Central Section Meeting, South Bend, IN (April 2000).
29. G. L. Matthews, "Weierstrass m -tuples and minimum distance of Goppa codes," Special Session in Algebraic Geometry at AMS Southeastern Section Meeting, Charlotte, NC (October 1999).

Invited colloquia

1. G. L. Matthews, "Supercodes from evaluation," Texas A&M University at Galveston, Galveston, TX (April 2011).
2. G. L. Matthews, "Decoding general AG codes using lists," Department of Mathematics Colloquium, University of Nebraska, Lincoln, NE (February 2008).
3. G. L. Matthews, "Multipoint codes are super codes," Department of Mathematics Colloquium, College of Charleston, Charleston, SC (September 2006).
4. G. L. Matthews, "Codes from curves," Department of Mathematics Colloquium, Virginia Tech, Blacksburg, VA (November 2005).
5. G. L. Matthews, "Floors and ceilings of divisors with applications to codes," Mathematics Department Colloquium, U. S. Naval Academy, Annapolis, MD (April 2004).
6. G. L. Matthews, "Floors and ceilings and good error-correcting codes", Mathematics Department Colloquium, Trinity University, San Antonio, TX (March 2004).
7. G. L. Matthews, "Gap sets and error-correcting codes," Department of Pure and Applied Mathematics Colloquium, Washington State University, Pullman, WA (March 2001).
8. G. L. Matthews, "Gap sets and error-correcting codes," Department of Mathematics and Statistics Colloquium, University of Missouri-Rolla, Rolla, MO (February 2001).
9. G. L. Matthews, "Gap sets and error-correcting codes," Department of Mathematical Sciences Colloquium, Clemson University, Clemson, SC (February 2001).

Invited colloquia (continued)

10. G. L. Matthews, "Gap sets and error-correcting codes," Department of Mathematical Sciences Colloquium, Florida Atlantic University, Boca Raton, FL (February 2001).
11. G. L. Matthews, "Weierstrass pairs and minimum distance of Goppa codes," Department of Mathematics and Computer Science Colloquium, San Diego State University, San Diego, CA (January 1999).
12. G. L. Matthews, "Weierstrass pairs and minimum distance of Goppa codes," Department of Mathematical Sciences Colloquium, Florida Atlantic University, Boca Raton, FL (February 1999).
13. G. L. Matthews, "Weierstrass pairs and minimum distance of Goppa codes," Department of Mathematical Sciences Colloquium, Michigan Technological University, Houghton, MI (January 1999).

Other invited presentations

1. G. L. Matthews, "Some mathematics behind bar codes, credit card numbers, and compact discs," Emory and Henry College, Bristol, VA (April 2007).
2. G. L. Matthews, "Some mathematics behind bar codes, credit card numbers, and compact discs," East Tennessee State University Mathematics Honors and Awards Banquet, Johnson City, TN (April 2003).

Contributed conference presentations

1. G. L. Matthews and W. Kositwattanarek, "Cones and ternary codes," Combinatexas, Huntsville, TX (April 2011).
2. G. L. Matthews and J. D. Peachey, "On Weierstrass semigroups of m -tuples of places on function fields associated with linearized polynomials," Joint Mathematics Meetings, New Orleans, LA (January 2011).
3. G. L. Matthews and J. D. Peachey, "Extended norm-trace codes," Soria Summer School on Computational Mathematics: Algebraic Geometric Modelling in Information Theory, Soria, Spain (July 2010).
4. W. Kositwattanarek and G. L. Matthews, "On irreducible pseudocodewords of binary parity check codes," IEEE International Symposium on Information Theory, Austin, TX (June 2010).
5. G. L. Matthews and J. D. Peachey, "The extended norm-trace function field and applications," Minisymposium on Algebraic Coding Theory, SIAM Conference on Discrete Mathematics, Austin, TX (June 2010).
6. G. L. Matthews and J. D. Peachey, "Riemann-Roch spaces of the norm-trace function field," Ninth International Conference on Finite Fields and Applications, Dublin, Ireland (July 2009).
7. R. C. Laskar, G. L. Matthews, B. Novick, and J. Villalpando, "On irreducible no-hole $L(2,1)$ colorings of trees," 20th Cumberland Conference on Discrete Mathematics, Atlanta, GA (May 2007).
8. G. L. Matthews, "Unique decoding of m -point codes using lists," Groebner Bases in Cryptography, Coding Theory, and Algebraic Combinatorics, Linz, Austria (May 2006).

Contributed conference presentations (continued)

9. R. E. Jamison and G. L. Matthews, "Distance two colorings and their relatives on products of trees and cycles," 37th Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Boca Raton, FL (March 2006).
10. M. A. Coleman, N. Drake, and G. L. Matthews, "Parameters of codes from quotients of Hermitian curves," 37th Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Boca Raton, FL (March 2006).
11. G. L. Matthews, "The Weierstrass semigroup of an m -tuple of collinear points on a Hermitian curve," Seventh International Conference on Finite Fields and Applications, Toulouse, France (May 2003).
12. G. L. Matthews, "On algebraic geometry codes from Suzuki curves," Special Session in Coding Theory, Second Irish Conference on the Mathematical Foundations of Computer Science and Information Technology, Galway, Ireland (July 2002).
13. G. L. Matthews, "Numerical semigroups and arithmetic sequences," South Central Regional Weekend Algebra Conference, New Orleans, LA (April 2002).
14. G. L. Matthews, "Chains of numerical semigroups," SERMON: Southeast Regional Meeting On Numbers, Clemson, SC (March 2002).
15. G. L. Matthews, "Chains of numerical semigroups," 33rd Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Boca Raton, FL (March 2002).
16. G. L. Matthews, "Weierstrass pairs and minimum distance of Goppa codes," Joint Mathematics Meetings, San Antonio, TX (January 1999).

Seminar talks

1. G. L. Matthews, "Multipoint codes as subcodes and implications for decoding," Number Theory Seminar, University of South Carolina, Columbia, SC (September 2006).
2. G. L. Matthews, "Automorphisms of codes and Riemann-Roch spaces," Informal Algebra and Number Theory Seminar, Clemson University, Clemson, SC (October 2003).
3. G. L. Matthews, "Suzuki function fields and a few good codes," Algebra-Cryptology Seminar, Florida Atlantic University, Boca Raton, FL (September 2003).
4. G. L. Matthews, "A coding theory mystery solved," Informal Algebra and Number Theory Seminar, Clemson University, Clemson, SC (January 2003).
5. G. L. Matthews, "Semigroups of triples of points on Hermitian curves," Clemson University Algebra and Discrete Mathematics Seminar, Clemson, SC (September 2002).
6. G. L. Matthews, "Codes and curves I-IV," Clemson University Informal Algebra and Number Theory Seminar, Clemson, SC (November-December 2002).
7. G. L. Matthews, "Error-correcting codes and compact discs," University of Tennessee NSF Research Experience for Undergraduates Faculty Seminar, Knoxville, TN (July 2001).

Seminar talks (continued)

8. G. L. Matthews, "Error-correcting codes and compact discs," Tennessee Technological University Graduate Student Seminar, Cookeville, TN (March 2001).
9. G. L. Matthews, "Algebraic geometry codes and gap sets," University of Virginia Coding Theory Seminar, Charlottesville, VA (October 2000).
10. G. L. Matthews, "Error-correcting codes and applications," University of Tennessee NSF Research Experience for Undergraduates Faculty Seminar, Knoxville, TN (July 2000).
11. G. L. Matthews, "The Weierstrass gap set of an m -tuple and minimum distance of algebraic geometry codes," Clemson University Algebra/Discrete Math Seminar, Clemson, SC (April 2000).
12. G. L. Matthews, "Codes and curves I-XI: An introduction to algebraic geometry codes," Algebra Seminar, University of Tennessee, Knoxville, TN (Fall 1999).
13. G. L. Matthews, "Weierstrass pairs and minimum distance of Goppa codes," Coding Theory Seminar, San Diego State University, San Diego, CA (January 1999).
14. G. L. Matthews, "Weierstrass pairs and minimum distance of Goppa codes," Louisiana State University Algebra Seminar, Baton Rouge, LA (October 1999).

Other presentations

1. G. L. Matthews, "Polynomials and knots," Lee High School, Baton Rouge, LA (October 1997, October 1996).
2. G. L. Matthews, "Uses of polynomials in knot theory," Lee High School, Baton Rouge, LA (October 1996).

HONORS AND AWARDS

2010 Mathematical Sciences Faculty Teaching Award (April 2010)

2002 Award for Faculty Excellence, Clemson University Board of Trustees (April 2003)

2002 Ralph E. Powe Junior Faculty Award (May 2002)

Selected Recent Ph.D. Workshop Presenter, AWM (January 2001)

Project NExT Fellowship, MAA (1999-2000)

Teaching Excellence Award, Louisiana State University Mathematics Department (December 1998)

Board of Regents Graduate Fellowship, Louisiana State University (1995-1998)

SPONSORED RESEARCH

"Iterative decoding of q -ary parity-check codes and related problems," NSF, PI, \$352,834, in review (submitted October 2011).

"Iterative decoding of q -ary parity-check codes and related problems," NSA, PI, \$62,637, in review (submitted October 2011).

"Algebraic analysis of parity check codes and iterative decoding," NSF, PI, \$120,000 (\$120,000), (2009-2012).

"Codes from algebraic geometry: constructions and algorithms for implementation," NSA, PI, \$30,000 (\$30,000), (2007-2009).

"Palmetto number theory series," NSA, Co-PI, \$15,000 (\$3000), (2007-2008).

SPONSORED RESEARCH (continued)

- “Palmetto number theory series,” NSF, Co-PI, \$8,250 (\$1650), (2007-2008).
- “Algebraic geometry codes and related structures,” NSA, PI, \$30,000 (\$30,000), (2006-2008).
- “Acquisition of parallel computing cluster for large-scale computational problems in the mathematical sciences,” NSF, Co-PI, \$140,570 (\$12,600), (2005-2006).
- “Applications of semigroups to algebraic geometry codes,” NSF, PI, \$104,837 (\$104,837), (2002-2006).
- “Better codes using Suzuki curves,” Clemson University Research Grant Committee, PI, \$1,750 (\$1,750), (2002-2003).
- “Semigroups and error-correcting codes,” Oak Ridge Associated Universities, PI, \$5,000 (\$5,000), (2002-2003).

ADDITIONAL SPONSORED ACTIVITY

- NSF-AWM Travel Grant, \$1800, (2008).
- “Codes and cryptography,” a Clemson University Creative Inquiry Grant to train team of undergraduates in applied algebra and number theory (together with Shuhong Gao and Hiren Maharaj), \$2500 (2006-2009).
- Grant to establish math clubs for girls in three middle schools in Knoxville, TN, MAA/Tensor Foundation, \$5000, (2001-2002).
- Travel Grant, Association for Women in Mathematics, \$500, (2001).
- Travel Grant, National Science Foundation, \$1000, (2000).

GRADUATE STUDENT ADVISING

Doctoral graduates

- Kositwattanarerk, W., “Pseudocodewords of parity-check codes,” (August 2011).
- Drake, N., “Decoding of multipoint algebraic geometry codes via lists,” (December 2009).

Masters graduates

- Hyde-Volpe, J., (M.S., Mathematical Sciences), “Quantum codes from two-point Hermitian codes,” (August 2010).
- Peachey, J., (M.S., Mathematical Sciences), “On Weierstrass semigroups of some m -tuples on norm-trace curves,” (May 2009).
- Hicks, B., (M.S., Mathematical Sciences), “Investigating the regularity of decomposition graphs of prisms,” (May 2009).
- Thomas, R., (M.S., Mathematical Sciences), “Gene networks modeled by polynomials over finite fields,” (May 2008).
- Marshall, J. (M.S., Mathematical Sciences), “On the number of Weierstrass semigroups of triples on the Hermitian curve,” (May 2007).
- Coleman, M. (M.S., Mathematical Sciences), “Semigroups and exact minimum distances of codes from a quotient of the Hermitian curve,” (May 2005).
- Graham, S., (M.S., Mathematical Sciences), “Decoding arrays for two-point codes,” (May 2005).
- Drake, N., (M.S., Mathematical Sciences), “Exact minimum distances of some two-point Hermitian codes,” (May 2004).

Masters graduates (continued)

- Michel, T., (M.S., Mathematical Sciences), “One-point codes using places of higher degree,” (May 2004).
- Durham, K., (M.S., Mathematical Sciences), “Some Weierstrass semigroups on certain maximal curves,” (May 2003).
- Bedford, T. A., (M.S., Mathematics, University of Tennessee), “ \mathbb{Z}_4 -linear codes,” (August 2001).

Current graduate advising

- Anderson, S., (Ph.D., Mathematical Sciences), in progress.
- Peachey, J., (Ph.D., Mathematical Sciences), “Explicit bases for Riemann-Roch spaces of function fields with many rational places and applications,” (expected December 2011).

HONORS STUDENT ADVISING

Bachelors graduates

- Hyde-Volpe, J., (B.S., Mathematical Sciences with honors), “Quantum codes from two-point Hermitian codes,” (May 2009).
- Baber, C., (B.S., Mathematical Sciences with honors), “Distance 2 colorings of certain generalized Petersen graphs,” (May 2007).
- Robinson, R., (B.S., Computer Science and Mathematical Sciences with honors), “On the dual and Lipman chains of a special family of numerical semigroups,” (May 2004).
- Bayless, J., (B.S., Mathematical Sciences with honors), “On the group generated by an n -cycle and an involution,” (May 2003).

TEACHING

Clemson University

- MTHSC 311, Linear Algebra, Fall 2001
- MTHSC 129, Problem Solving in Discrete Mathematics, Spring 2002
- MTHSC 851, Abstract Algebra I, Spring 2002
- MTHSC 482H, Honors Research, Fall 2002
- MTHSC 852, Abstract Algebra II, Fall 2002
- MTHSC 129, Problem Solving in Discrete Mathematics, Spring 2003
- MTHSC 892, Master’s Project Course, Spring 2003
- MTHSC 985, Algebraic Function Fields and Codes, Spring 2003
- MTHSC 970, Directed Studies in Coding Theory, Summer 2003
- MTHSC 991, Doctoral Research, Summer 2003
- MTHSC 102, Introduction to Mathematical Analysis, Fall 2003 (2 sections)
- MTHSC 482H, Honors Research, Fall 2003
- MTHSC 129, Problem Solving in Discrete Mathematics, Spring 2004 (2 sections)
- MTHSC 482H, Honors Research, Spring 2004
- MTHSC 851, Abstract Algebra I, Spring 2004
- MTHSC 892, Master’s Project Course, Spring 2004
- MTHSC 970, Topics in Algebraic Function Fields, Summer 2004
- MTHSC 129, Problem Solving in Discrete Mathematics, Spring 2005

Clemson University (continued)

MTHSC 853, Matrix Analysis, Spring 2005
MTHSC 892, Master's Project Course, Spring 2005
MTHSC 970, Topics in Coding Theory, Summer 2005
MTHSC 129, Problem Solving in Discrete Mathematics, Fall 2005
MTHSC 853, Matrix Analysis, Fall 2005
MTHSC 129, Problem Solving in Discrete Mathematics, Spring 2006 (2 sections)
MTHSC 985, Theory of Error-correcting Codes, Spring 2006
MTHSC 129, Problem Solving in Discrete Mathematics, Fall 2006
MTHSC 482H, Honors Research, Fall 2006
MTHSC 853, Matrix Analysis, Fall 2006
MTHSC 481, Codes and Cryptography, Spring 2007
MTHSC 892, Master's Project Course, Spring 2007
MTHSC 129, Problem Solving in Discrete Mathematics, Fall 2007
MTHSC 491, Independent Study on the Frobenius Problem, Fall 2007
MTHSC 491, Creative Inquiry in Codes and Cryptography, Fall 2007
MTHSC 853, Matrix Analysis, Fall 2007
MTHSC 851, Abstract Algebra I, Spring 2008
MTHSC 129, Problem Solving in Discrete Mathematics, Spring 2008
MTHSC 892, Master's Project Course, Spring 2008
MTHSC 852, Abstract Algebra II, Fall 2008
MTHSC 129, Problem Solving in Discrete Mathematics, Fall 2008
MTHSC 482H, Honors Research, Fall 2008
MTHSC 108, Calculus of One Variable II, Spring 2009 (2 sections)
MTHSC 482H, Honors Research,, Spring 2009
MTHSC 892, Master's Project Course, Spring 2009
MTHSC 108, Calculus of One Variable II, Fall 2009
MTHSC 129, Problem Solving in Discrete Mathematics, Fall 2010 (2 sections)
MTHSC 119, Introduction to Discrete Methods, Spring 2011 (2 sections)
MTHSC 206, Calculus of Several Variables, Fall 2011 (2 sections)

University of Tennessee

MATH 141, Calculus I, Fall 1999 (2 sections), Fall 2000
MATH 251, Linear Algebra, Spring 2000
MATH 551, Abstract Algebra I, Fall 2000
MATH 552, Abstract Algebra II, Spring 2001

Louisiana State University

MATH 1020, Developmental College Algebra, Fall 1998
MATH 1550, Calculus I, Spring 1999

UNIVERSITY AND PUBLIC SERVICE

Continuing education

- Co-organizer, AMS Special Session on Advances in Coding Theory at Joint Mathematics Meetings (January 2012).
- Instructor, Project WISE (Women in Science and Engineering) summer camp “Math, Science, and Engineering: It’s a girl thing!” (June 2004, June 2005, July 2006, June 2007, June 2008, June 2009, June 2010, June 2011).
- Instructor, PAW - PEER and WISE - Day, recruiting activity for groups underrepresented in science and engineering (April 2009).
- Co-organizer, AMS Special Session on Recent Advances in Coding Theory at Joint Mathematics Meetings (January 2009).
- Co-founder and co-organizer, PaNTS: Palmetto Number Theory Series, (2006-2008).
- Instructor, PEER (Programs for Education, Enrichment, and Retention) Mathematics Excellence Workshop (Summer 2006, Summer 2007).
- Co-organizer, AMS Special Session on Algebraic Geometry Codes at Joint Mathematics Meetings (January 2005).
- Organizer, Research Experiences for Undergraduates Poster Session at Joint MAA Southeastern Section/SIAM Southeast Atlantic Section Meeting, (March 2003).
- Invited researcher, American Institute of Mathematics Workshop “Rational and integral points on higher dimensional varieties,” (December 2002).
- Organizer, “SHaring ADventures in Engineering and Science (SHADES): An interactive colloquium in engineering and science for middle school girls,” mathematics session (March 2001).
- AWM representative, MSRI CRAFTY Workshop “The Preparation of Math Majors in the First Two Years,” (February 2001).
- Research advisor, NSF Research Experiences for Undergraduates in Pure and Applied Mathematics, University of Tennessee (Summer 2000, 2001).
- Co-organizer, Project NExT Session on Creative Research Techniques at Joint Mathematics Meetings (January 2000).
- Co-organizer, Louisiana State University Graduate Student Seminar (1996-1997).

Committees

- Department: Mathematical Sciences Faculty Teaching Award selection committee (2011-2012)
- Sabbatical Review committee (2011-2012)
- Mathematical Sciences Council, Algebra and Discrete Mathematics Representative (2008-2009, 2010-present)
- Algebra and Discrete Mathematics Subfaculty Coordinator (2005-)
- Calculus textbook committee (2009)
- Department chair review committee (2008-2009)
- Algebra and Discrete Mathematics Seminar Organizer (2002-2004)
- Member, Mathematics Department Committee to Increase Undergraduate Enrollment, University of Tennessee (1999-2001)
- Member, Tennessee Math Contest Exam Writing Committee (Fall 2000)

Other service

Member, Editorial board, *Journal of Coding Theory* (2010-)

Coordinator, Math Superstars, Clemson Elementary School (2010-)

Teaching mentor for junior faculty (2008-)

Academic advisor for graduate and undergraduate students in math sciences (2002-)

Referee for *Journal of Algebra*; *IEEE Transactions on Information Theory*; *Designs, Codes and Cryptography*; *Finite Fields and their Applications*; *Applicable Algebra in Engineering, Communication and Computing*; *Linear Algebra and its Applications*; *Communications in Algebra*; *Advances in Mathematics of Communications*; *SIAM Journal on Discrete Mathematics*; *Discrete Applied Mathematics*; *Pacific Journal of Mathematics*; *European Journal of Combinatorics*; *Proceedings of the 2003 Arithmetic and Birational Geometry Conference*; *Discussiones Mathematicae Graph Theory*; *Integers*; and *Houston Journal of Mathematics*.

Reviewer, Calculus text (2009)

Reviewer, Discrete mathematics text (2008)

Consultant, MAA Project NExT (2007-2008)

Mentor, AWM Mentor Network (2002-)

Outreach volunteer, Westhaven Elementary School, Knoxville, TN (2000-2001).

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