

# JIM GLEASON

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## Education:

Ph.D., Mathematics, University of California, Santa Barbara, June 2002  
Thesis Title: *Subnormal and Fredholm tuples of operators*  
Primary Subject: Multivariable Operator Theory  
Thesis Advisor: Professor Mihai Putinar

M.A., Mathematics, University of California, Santa Barbara, June 1998.  
B.S., Mathematics, Azusa Pacific University, Dec. 1995

## Teaching:

|                              |                                      |                |
|------------------------------|--------------------------------------|----------------|
| <b>University of Alabama</b> | Director of Introductory Mathematics | (2011-present) |
|                              | Associate Professor                  | (2011-present) |
|                              | Assistant Professor                  | (2005-2011)    |

### *Courses Taught:*

Calculus I, II, & III (MATH 125, 126, & 227)  
Calculus and Its Applications (MATH 121)  
Number Theory (MATH 307)  
Complex Calculus (MATH 485/585)  
Introduction to Analysis I (MATH 486)  
Mathematics for Elementary Teachers: Numbers and Operations (MATH 208)  
Mathematics for Elementary Teachers: Geometry and Measurement (MATH 209)  
History of Mathematics (MATH 402/502)  
Advanced Mathematical Connections and Their Development (MATH 403/503)  
Geometry for Teachers (MATH 405/505)  
Advanced Geometry (MATH 467/567)  
Teaching College Mathematics (MATH 591)  
Collegiate Mathematics Education Research (MATH 593)

### *Independent Study Courses for Teachers:*

Number Systems, Functions and Equations, Mathematical Knowledge for Teaching

|                                |                    |             |
|--------------------------------|--------------------|-------------|
| <b>University of Tennessee</b> | Lecturer (Postdoc) | (2002-2005) |
|--------------------------------|--------------------|-------------|

*Courses Taught:* Calculus I & II, Matrix Algebra, Advanced Calculus I & II, Differential Equations, Discrete Mathematics for Teachers

|                                                |                              |             |
|------------------------------------------------|------------------------------|-------------|
| <b>University of California, Santa Barbara</b> | Teaching Assistant/Associate | (1996-2002) |
|------------------------------------------------|------------------------------|-------------|

*Courses Taught:* Precalculus, Calculus II & III, Calculus for the Social Sciences, Linear Algebra, Differential Equations, Mathematics for Elementary Education

## Research:

### Research Interests:

Mathematics Education (Educational Measurement, Content Knowledge for Teaching, Undergraduate Mathematics Education)

Operator Theory (Multivariable Operator Theory, Subnormality, Fredholm properties)

## Publications:

### Peer Reviewed

#### Published

- Bargagliotti, A.E., Botelho, F., Gleason, J., Haddock, J., & Windsor, A. (2011). A report on the effectiveness of blended instruction in general education mathematics courses. In (Eds.) S. Brown, S. Larsen, K. Marrongelle, and M. Oehrtman, *Proceedings of the 14th Annual Conference on Research in Undergraduate Mathematics Education*, Vol. 1, pg 25-38. Portland, Oregon. (Article Link)
- Gleason, J., Boykin, K., Johnson, P., Bowen, L., Raju, D., & Slappey, C. (2010). Integrated engineering math-based summer bridge program for student retention. *Advances in Engineering Education*, 2(2). (Article Link)
- Gleason, J., Alley, A., & Baker, S. (2010). The effect of item-writing rules on the reliability of an instrument to measure mathematical knowledge for teaching. *Journal of Mathematical Sciences and Mathematics Education*, 5(2): 21-27. (Article Link)
- Gleason, J. (2010). Reliability of the content knowledge for teaching mathematics instrument for pre-service teachers. *Issues in the Undergraduate Mathematics Preparation of School Teachers*, Volume 1 (Content Knowledge), January 2010. Article Link
- Gleason, J. (2008). An evaluation of the 2008 Alabama statewide mathematics competitions. *Alabama Journal of Mathematics*, 32: 65-73. (Article Link)
- Gleason, J. (2008). Measuring math anxiety of elementary teachers. *Academic Exchange Quarterly*, 12(2): 75-78. (Article Link)
- Gleason, J., Belcher, J., Britt, D., & Savich, P. (2008). Incorporating a critical pedagogy of place in the mathematics classroom: Rural school bussing. *Journal of Teaching and Learning*. 5(2): 23-37. (Article Link)
- Gleason, J. & Rosentrater, C. R. (2008). Xia's analytic model of a subnormal operator and its applications. *Rocky Mountain Journal of Mathematics*, 38(3):849-889. (Article Link)
- Gleason, J. (2008). Relationships between pre-service elementary teachers' mathematics anxiety and content Knowledge for Teaching. *Journal of Mathematical Sciences and Mathematics Education*, 3(1): 39-47. (Article Link)
- Gleason, J. (2008). An evaluation of mathematics competitions using item response theory. *The Notices of the American Mathematical Society*, 55(1): 8-15. (Article Link)
- Gleason, J. & Richter, S. (2006).  $m$ -isometric commuting tuples of operators on a Hilbert space. *Integral Equations Operator Theory*, 56(2):181-196. (Article Link)
- Gleason, J. (2006). Teaching mathematics online: A virtual classroom. *Journal of Online Mathematics*. March 2006. (Article Link)
- Gleason, J. & Rosentrater, C. R. (2006). The mosaic and principal function of a subnormal operator. *Integral Equations Operator Theory*, 55(1):69-82. (Article Link)
- Gleason, J. (2006). Quasinormality of Toeplitz tuples with analytic symbols. *Houston Journal of Mathematics*, 32(1):293-298. (Article Link)
- Gleason, J., Richter, S., & Sundberg, C. (2005). On the index of invariant subspaces in spaces of analytic functions of several complex variables. *J. Reine Angew. Math.*, 587:49-76. (Article Link)

- Conway, J. B. & Gleason, J. (2005). Absolute equivalence of Dirac operators. *Integral Equations Operator Theory*, 51(1):57–71. (Article Link)
- Gleason, J. (2003). Matrix construction of subnormal tuples of finite type. *Journal of Mathematical Analysis and Applications*, 284(2):593–602. (Article Link)
- Gleason, J. (2002). On a question of Ameer Athavale. *Irish Mathematical Society Bulletin*, 48:31–33. (Article Link)
- Gleason, J. (2001). Perturbations of a Fredholm complex by inessential operators. *Georgian Mathematical Journal*, 8(1):61–67. (Article Link)

### In Press

- Gleason, J. (2012). Using technology assisted instruction and assessment to reduce the effect of class size on student outcomes in undergraduate mathematics courses. *College Teaching*

### Under Review

- Bargagliotti, A., Botelho, F., Gleason, J., Haddock, J., & Windsor, A. (2012). The effectiveness of blended instruction in postsecondary general education mathematics courses.
- Zelkowski, J., Gleason, J., Cox, D., & Bismarck, S. (2012). TPACK: Developing and validating a self-assessment instrument for secondary mathematics preservice teachers.

### Proceedings (Peer Reviewed Abstract)

- Bakker, M.G., Gleason, J., Nichols, S., Kuntz, A., Sundberg, C., Busenlehner, L., Chopra, N., Evans, R., Spencer, P., Murphy, A. (2011). Project VISTA: Building University/K-12 Learning Communities by Developing Materials Science Experiments. MRS Online Proceedings Library, Volume 1320, MRSF 10-1320-XX02-02. (Article Link)
- Bakker, M. G., Staggemeier, K., Grano, A., Kuntz, A., Gleason, J., McKenzie, L., O’Neal, B. & Pace, R. (2010). Identification, Development and Implementation of Nanoscience Activities for Alabama K-12, in *Materials Education*, edited by Marshall, E., Nucci, J., Dunham, D., & Patterson, M.M. (Materials Research Society Symposium Proceedings Volume 1233, Warrendale, PA, 2010), PP4.21. (Article Link)
- Gleason, J. (2010). Effect of Class Size on Student Outcomes in Mathematics Courses with Technology Assisted Instruction and Assessment. *Proceedings of the Conference on Research in Undergraduate Mathematics Education* (Article Link)

### Non-Peer Reviewed

- Bakker, M.G., Gleason, J., Nichols, S., Kuntz, A., Sundberg, C., Busenlehner, L., Chopra, N., Evans, R., & Spencer, P. (2010). VISTA: Vertical Integration of Science and Technology in Alabama. *Curriculum Leadership*, 8 (30). (Article Link)
- Gleason, J. (2006). Top 10 Suggestions for Teaching an Online Mathematics Course. *Rural Math Educator*, 5(1).
- Gleason, J. & Long, V. (2005). An evaluation of the Master of Mathematics program at the University of Tennessee. Completed Spring 2005 for the Department of Mathematics at the University of Tennessee.

## Grants - Funded

Principal Investigator on a total of 5 grants funded for \$24,758.

Co-PI or Senior Personnel on a total of 3 grants funded for \$2,589,373.

Pilot of UA STEM/Area Middle and High School Partnership, University of Alabama Vice President of Research, Graduate School, Vice President of Community Affairs, Council for Community Based Partnerships, College of Arts and Sciences, College of Engineering, College of Education, (co-PI), (\$19,905). (2010-2011).

Enhancement of the Calculus readiness of Chemistry Majors for Physical Chemistry, The University of Alabama Academy for Improvement of Student Success, (Co-PI) (\$7,800). (2010-2011).

NSF MSP-START Integration of Nano and Biotechnology into the Classroom, (Co-PI) (\$71,700 sub-contract for organization and evaluation of statewide \$300,000 proposal). (2008-2010)

NSF Alabama EPSCoR RII (Co-PI) (\$1,500,000 sub-contract for the Education, Outreach, and Diversity Portion, of \$15,000,000 total state-wide grant). (2008-2010)

Professional Development of Mathematics Teachers (Alabama Mathematics Science and Technology Initiative) (PI), \$10,057.62. (Fall 2007-Spring 2008).

NSF Engineering Mathematics Advancement Program (Senior Personnel, Research Assistant), \$989,968. (2008-2010)

In-service teacher training in mathematics (Alabama Mathematics Science and Technology Initiative) (PI), \$4,300. (Spring-Summer 2007)

Mathematical Knowledge for Teaching Calculus - An Exploratory Study (PI), The University of Alabama Research Advisory Committee, \$5000. (2006)

Preliminary Evaluation of Courses for Elementary Education Majors (PI), Jim Walter Resources, \$5000. (2005-2006)

## Grants - Pending

Impact of Blending Inquiry-Based Instruction on Student Learning and Longitudinal Retention of Knowledge in Algebra, (PI on subcontract), NSF through UAB. (\$112,246 subcontract on \$599,852 grant) (submitted 01/13/12).

## Grants - Unfunded

The University of Alabama Noyce Scholars Program (Senior Personnel), National Science Foundation. (\$1,450,000). (submitted 03/23/2011).

Vertical Integration of Science and Technology in Alabama, (Co-PI), National Science Foundation. (\$300,000). (submitted 07/08/10).

The Memphis Mathematics Method (PI on subcontract), U.S. Department of Education through University of Memphis. (\$190,661 subcontract on \$2,000,000 grant) (submitted 06/03/10)

A National Assessment of Mathematical College-Readiness Related to Scheduling Format in Secondary Schools, (Co-PI), American Educational Research Association, (\$35,000) (submitted 03/16/10)

The Memphis Mathematics Method: Evaluating the efficacy of employing blended instruction as a strategy to produce differential gains in student learning in postsecondary general education mathematics courses (Consultant), U.S. Department of Education, (\$50,000 subcontract on \$1,000,000 grant). (submitted June 2009)

Teaching College Mathematics Professional Development: Training undergraduate mathematics faculty in the art and science of research-based teaching, National Science Foundation, (PI) (\$118,561). (submitted May 2009)

NSF STEM Learning Community, (Co-PI), (\$2,500,000). (submitted October 2008)

Changing the Mathematical Development of Teachers (PI), Toyota - USA Foundation, (\$175,000). (submitted August 2007)

Changing the Mathematical Development of Teachers (PI), Jim Walter Resources, (\$28,000). (submitted August 2007)

Alabama Robert Noyce Mathematics Scholars Program (PI), National Science Foundation, (\$175,000). (submitted March 2007)

CAREER: Mathematical Knowledge for Teaching Calculus (PI), National Science Foundation, (\$585,000). (submitted July 2006)

Evaluation of Courses for Elementary Education Majors (PI), Georgia-Pacific Foundation, (\$35,000). (submitted spring 2006)

Teaching College Mathematics: Training Undergraduate Mathematics Faculty in the Art and Science of Research-Based Teaching (PI), National Science Foundation, (\$107,612). (submitted May 2006)

## **Mathematics Education Conference/Seminar Talks:**

### **Invited Regional**

Alabama Mathematical Association of Two Year Colleges Annual Conference, Tuscaloosa, AL, Feb. 2010 (“Effect of Class Size on Student Outcomes” and “Writing Tests: What are we measuring?”)

Jacksonville State University Mathematics Seminar and Workshop, Jacksonville, AL, Nov. 2007. (Gave a seminar talk and afternoon workshop on Item Response Theory and applications for mathematics departments.)

ACCLAIM Symposium on Distance Education, West Liberty, Kentucky, Oct. 2005. (Discussed teaching mathematics courses online.)

### **National Conferences (Peer Reviewed)**

Conference on Research in Undergraduate Mathematics Education, Portland, OR, Feb. 2011 (“The effectiveness of blended instruction in postsecondary general education mathematics courses”)

Conference on Research in Undergraduate Mathematics Education, Portland, OR, Feb. 2011 (“Determining Mathematical Item Characteristics Corresponding with Item Response Theory Item Information Curves”)

Conference on Research in Undergraduate Mathematics Education, Raleigh, NC, Feb. 2010. (“Effect of Class Size on Student Outcomes in Mathematics Courses with Technology Assisted Instruction and Assessment”)

Association of Mathematics Teacher Educators (AMTE) Annual Meeting, Orlando, FL, Feb. 2009. (“Measuring the mathematical knowledge for teaching of pre-service elementary teachers”)

Association of Mathematics Teacher Educators (AMTE) Annual Meeting, Tulsa, OK, Jan. 2008. (“An evaluation of mathematics content courses for pre-service elementary teachers”)

### **National Conferences (Other)**

Joint Mathematics Meetings, New Orleans, LA, Jan. 2011. (“The effectiveness of blended instruction in postsecondary general education mathematics courses”)

American Mathematical Association of Two-Year Colleges Annual Conference, Boston, MA, Nov. 2010. (“Measuring the Reliability of Common Exams Using Item Response Theory”)

Joint Mathematics Meetings, San Diego, CA, Jan. 2008. (“Evaluating mathematics courses for elementary teachers: Mathematical knowledge and dispositions for teaching”)

Mathematical Association of America Mathfest, Knoxville, TN, Aug. 2006. (“Preliminary results of an evaluation of courses for elementary teachers”)

### **Regional Conferences**

Alabama Association of College Teachers of Mathematics, Athens, AL, March 2012. (“Changing College Math Placement”)

Stepping Up to Move Alabama Ahead in College and Career Readiness, Montgomery, AL, Dec. 2011. (“Improving Course Rigor”)

Alabama Council of Teachers of Mathematics, Montgomery, AL, Oct. 2011. (“Preparing Your Students for College Mathematics Placement Tests”)

Alabama Association of College Teachers of Mathematics, Tuskegee, AL, Feb. 2010. (“Does class size matter?”)

Alabama Association of College Teachers of Mathematics, Jacksonville, AL, Feb. 2009. (“What is AMTE-A?”)

Fall Central Section Meeting of the AMS, Kalamazoo, MI, Oct. 2008. (“Structure of the Content Knowledge for Teaching-Mathematics (CKT-M) Instrument with Pre-service Teachers”)

TEAM-Math Annual Conference, Tuskegee, AL, Sept. 2008. (“Statewide cooperation to improve the mathematical education of elementary teachers”)

Alabama EPSCoR Annual Conference and Stakeholder Symposium, Montgomery, AL, July 2008. (“Outreach Activities in Alabama”)

TEAM-Math Conference, Tuskegee, AL, Aug. 2007. (“Graduate programs in mathematics education”)

Alabama Association of College Teachers of Mathematics, Tuscaloosa, AL, Feb. 2007. (Gave a talk discussing an evaluation of mathematics competitions.)

MAA Southeastern Section Regional Meeting, Auburn, AL, March 2006. (Gave a talk about rural mathematics education issues.)

Alabama Association of College Teachers of Mathematics, Jacksonville, AL, Feb. 2006. (Organized and led panel discussion on mathematics content courses for pre-service elementary teachers.)

**Additional Mathematics Education Conferences Attended:**

- Alabama Association of Two-Year Colleges, Athens, AL, March 2012.
- Conference on Research in Undergraduate Mathematics Education, Portland, OR, Feb. 2012
- American Mathematical Association of Two-Year Colleges, Austin, TX, Nov. 2011.
- Mathematical Association of America Southeastern Section, Tuscaloosa, AL, April 2011.
- Alabama Association of Two-Year Colleges, Birmingham, AL, Feb. 2011.
- Alabama Association of College Teachers of Mathematics, Montgomery, AL, Feb. 2011.
- Mathematical Association of America Mathfest, Portland, OR, Aug. 2009.
- NCTM Research Pre-session, Atlanta, GA, March 2007.
- Association of Mathematics Teacher Educators (AMTE) Annual Meeting, Irvine, CA, Jan. 2007.
- The 2006 TEAM-Math Conference, Tuskegee, AL, Aug. 2006.
- Preparing Mathematicians to Educate Teachers (PMET), Tuscaloosa, AL, May 2006.
- ACCLAIM Symposium on Rural Mathematics Education, Cherry Valley, OH, May 2006.
- “Growing What Works”: 2006 Governor’s Summit for Mathematics and Science Education, Birmingham, AL, March 2006.
- AMS-MER Workshop on Excellence in Undergraduate Mathematics: Mobilizing for the Future, Phoenix, AZ, Dec. 2005.
- NCTM Regional Meeting, Birmingham, AL, Oct. 2005.
- NCTM Annual Meeting, Anaheim, CA, Apr. 2005.

**Operator Theory Conference/Seminar Talks:**

- Analysis Seminar, University of Montana, Feb. 2005.
- Special Session of the Southeastern Section of the AMS, Vanderbilt University, Oct. 2004.
- International Workshop on Operator Theory and Applications (IWOTA), Newcastle, July 2004.
- Southeastern Analysis Meeting (SEAM), University of Alabama, March 2004.
- Special Session of Southeastern Section of the AMS, Chapel Hill, Oct. 2003.
- Southeastern Analysis Meeting (SEAM), University of Tennessee, March 2003.
- University of Tennessee Analysis Seminar, March 2002.
- Young Analysts Meeting of the Southeast (YAMS), Furman University, July 2001.

**Additional Operator Theory Conferences Attended:**

- Southeastern Analysis Meeting, Lexington, VA, Apr. 2005.
- Joint Meetings, Phoenix, AZ, Jan. 2004.
- Biennial Conference of the ACMS, San Diego, May 2003.
- Conference on Quadrature Domains, Santa Barbara, March 2003.

Joint Meetings, Baltimore, Jan. 2003.

Virginia Operator Theory and Complex Analysis Meeting, Richmond, Sept. 2002.

Joint Meetings, San Diego, Jan. 2002.

AMS Western Sectional Meeting, UC Irvine, Nov. 2001.

MAA Southern California Sectional Meeting, Loyola Marymount, Oct. 2001.

Mussomeli Conference on Operators on Banach Spaces, Sicily, Sept. 1999.

## Honors/Awards

Outstanding Faculty/Staff-Initiated Engagement Effort, UA Council on Community-Based Partnerships, 2009-2010. (with Martin Bakker, Aaron Kuntz, Sherry Nichols, Cheryl Sundberg, Nitin Chopra, Laura Busenlehner)

Member of the Azusa Pacific University Academic Hall of Honor, 2006 Inductee.

## Association Memberships:

American Mathematical Society

Mathematics Association of America

American Mathematical Association of Two Year Colleges

Alabama Mathematical Association of Two Year Colleges

Association of Mathematics Teacher Educators

Association of Mathematics Teacher Educators of Alabama

National Council of Teachers of Mathematics

Alabama Council of Teachers of Mathematics

West Alabama Council of Teachers of Mathematics

Alabama Mathematics, Science, and Technology Education Coalition

## Undergraduate Research Advising:

Kate Frederick, University of Tennessee, *Matricially Quasinormal Tuples*, 2004.

Heather Cheatum, Presbyterian College, *Quadrature Domains*, NSF-REU Program 2004.

Alison Barrentine, Elissa McIntyre, and Karla Mitchell, University of Alabama, *Undergraduate Mathematics Course Placement*, 2008.

Stephanie Baker, University of Alabama, *Mathematical Knowledge for Teaching*, 2009.



## Master's Degree Research Advising:

Ashley Alley, *The effect of item-writing rules on the reliability of an instrument to measure mathematical knowledge for teaching*, project, 2009.

Cara Coons, *Student Misconceptions of Algebra*, project, 2011.

Andrew Hamric, *Evaluating Mathematics Exam Items Using Expected Cognitive Approach and Given Information*, project, 2012.

Keri Flowers, *Equipping Elementary Teachers to Teach Mathematics*, project, 2012.

## Professional Development Workshops

In-service teacher professional learning community (25 participants), 2010-2011.

Organizer and facilitator for a two-day workshop for college faculty who teach mathematics courses for pre-service elementary teachers, August 2008.

In-service teacher workshops for middle school and high school teachers with AMSTI (10 workshops with approximately 140 teachers total), 2007-2010.

## Service:

### External Organizations:

President Elect/President/Past President, Association of Mathematics Teacher Educators of Alabama, 2009-2013.

President Elect/President/Past President, Alabama Mathematical Association of Two Year Colleges, 2010-2013.

Webmaster for Alabama Association of College Teachers of Mathematics, 2011-

Webmaster for Mathematical Association of America Southeastern Section, 2011-

President, Alabama Association of College Teachers of Mathematics, 2011-2012.

Vice President, Alabama Association of College Teachers of Mathematics, 2010-2011.

Chair of local organizing committee for Mathematical Association of American Southeastern Section Annual Meeting, 2010-2011.

Placement and Assessment Committee, American Mathematical Association of Two Year Colleges, 2010-present.

Member of the Executive Council of the Alabama Association of College Teachers of Mathematics, 2008-2010.

Member of the Executive Council of the Association of Mathematics Teacher Educators of Alabama, 2008-2009.

Local organizer for the Alabama Association of College Teachers of Mathematics annual meeting, Feb. 2007.

**Department Committees/Responsibilities:**

Course revision committee, Department of Mathematics, Spring 2010.

University of Alabama High School Mathematics Contest Coordinator, 2005-present.

Undergraduate Program Committee, Department of Mathematics, 2009.

Co-Advising all Secondary Mathematics Education majors, 2007-2009.

Mathematics Department Faculty Search Committee Member, 2006-2007.

Coordinator for Mathematics Education Seminar, 2005-2006.

Graduate Program Committee, Department of Mathematics, Spring 2006.

Undergraduate Program Committee, Department of Mathematics, Fall 2005.

**College Committees:**

Member Diversity Committee, College of Arts and Sciences, 2008-2011.

**Other:**

Journal Reviewer: Rocky Mountain Journal of Mathematics, Journal of Mathematical Analysis and Applications, Journal of Research in Rural Education, Journal for Research in Mathematics Education, Linear Algebra and Its Applications, Asia Pacific Journal of Education.

Review Panel for National Science Foundation, June 2006.