

FRANCIS ALEXANDER NORMAN, III

**Address**

University Address

Dept. of Mathematical Sciences  
University of Texas at San Antonio  
San Antonio, TX 78249  
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**Present Position**

Associate Professor of Mathematics & Chair  
University of Texas at San Antonio

**Education**

Ed.D.	Mathematics Education	University of Georgia Athens, GA 30602	March 87
M.A.	Mathematics	University of Georgia Athens, GA 30602	August 76
B.A.	Mathematics (Echols Scholar)	University of Virginia Charlottesville, VA 21903	June 74

Doctoral Dissertation. *An Examination of Students' Uses of Unitizing in Algebraic and Graphical Contexts*  
(under the direction of Professor Sigrid Wagner, Ph.D., Department of Mathematics Education, University of Georgia)

**Employment**

Associate Professor (& Chair) of Mathematics	UT-San Antonio San Antonio, TX 78249	1/93 – present (2007 – present)
Assistant Professor of Mathematics	UNC-Charlotte Charlotte, NC 28223	8/86 – 12/92
Teaching Assistant in Mathematics Education	University of Georgia Athens, Ga 30602	9/82 – 6/86
Adjunct Professor of Mathematics	Brenau College (Athens campus)	1985
Mathematics Teacher 7 - 12 grades	Athens Academy Athens, Ga 30677	6/80 - 6/82
Instructor/Special Studies Mathematics	University of Georgia Athens, Ga 30602	9/79 - 6/80
Teaching Assistant in Mathematics	University of Georgia Athens, Ga 30602	9/76 - 8/79

## Publications

- Norman, S. & Travis, B. (2008). Generalizing Pascal: the Euler triangles. *Resources for Teaching Discrete Mathematics*, Mathematical Association of America Notes, 74, 11-18.
- Cadena, J., Travis, B., & Norman, S. (2003). An Evaluation of reform in the teaching of calculus. *Journal of Mathematics and Computer Education*, 37(2), 210-220.
- Norman, F. A., & Prichard, M. K. (1994). Cognitive obstacles to the learning of calculus: a Krutetskiian perspective. In J. Kaput & E. Dubinsky (Eds.), *Research issues in undergraduate mathematics learning: Preliminary analyses and results* (pp. 63–78). Mathematical Association of America Notes, Number 33.
- Norman, F. A. (1993). Integrating research on teachers' knowledge of functions and their graphs. (In T. A. Romberg, E. Fennema, & T. P. Carpenter (Eds.), *Integrating research on the graphical representation of functions* (pp. 159–187). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Norman, F. A. (1992). Teachers' mathematical knowledge of the concept of function. In E. Dubinsky & G. Harel (Eds.), *The concept of function: Aspects of epistemology and pedagogy* (pp. 215–232). Mathematical Association of America Notes, Number 25.
- Norman, F. A. (1991). Figurate numbers in the classroom: Integrated mathematics activities. *Arithmetic Teacher*, 38(7), 42-45.
- Norman, F. A., & Prichard, M. K. (1990). Technology in preservice teacher education programs for elementary and secondary mathematics teachers. *Proceedings of the 2nd Annual Conference on Technology in Collegiate Mathematics*, (pp. 259-261). Addison-Wesley.
- Norman, F. A. (Ed.). (1990) *Sets of Mathematics Teaching Aids* (Kompleksy ochebnogo oburudovaniya po matematike). Antonovich, V. G., Boltyanskii, V. G., Volovich, M. B., Krass, E. Yu. and Levitas, G. G. (Joan Teller, tr.). NSF Survey of Applied Research in School Mathematics Education, Volume I. Soviet Studies in Mathematics Education Series: NCTM.
- Norman, F. A. (1989). Classicists and constructivists: a dilemma. *Mathematics Magazine*, 62(5), 340-342.
- Norman, F. A. (1988). Parameter-generated loci of critical points of polynomials. *College Mathematics Journal*, 19(3), 223-229.
- Norman, F. A. (1987). A psycholinguistic perspective of algebraic language. In J. C. Bergeron, N. Herscovics, & C. Kieran (Eds.), *Proceedings of the 11th International Conference for the Psychology of Mathematics Education, Vol. 1*, (pp. 324-330). Université de Montréal.
- Norman, F. A. (1986). Students' unitizing of variable complexes in algebraic and graphical situations. In G. Lappan and R. Even (Eds.), *Proceedings of the Eighth Annual Meeting of PME-NA*, (pp. 102-107). Michigan State University, East Lansing.
- Ponte, J., Norman, F. A., Davis, E. J., Eshun, B. A., & Jensen, R. J. (1986). Evaluation of an instructional computing inservice course for elementary and middle school teachers. *School Science and Mathematics*, 86(5), 375-385.
- Norman, F. A. (1986). Investigating generalized conics: An opportunity for students to create mathematics. *Reflections*, 33(2), 12-15.
- Davis, E. J., Owens, J., Woods, J., Norman, F. A., & Helms, J. (1986). *Logo handbook for teachers*. Department of Mathematics, University of Georgia.
- Norman, F. A. (1985). The hand-held calculator. *Reflections*, 32(2), 10-15.
- Norman, F. A., & Davis, E.J. (1985). Responses of members of GCTM to recommendations of the Governor's Education Review Commission. *Reflections*, 32(2), 4-7. (with E. J. Davis).
- Davis, E. J., Helms, J., Norman, F. A., & Ponte, J. (1984). Training elementary teachers to use computers - with emphasis on Logo. *Arithmetic Teacher*, 32(2), 18-25.

### Published Abstracts/Reviews

- Norman, F. A. (1993). Issues regarding calculus for the non-specialist. In M. Artigue & G. Ervynck (Eds.), *Proceedings of Working Group 7 on Students' Difficulties in Calculus* (pp. 71–72). Collège de Sherbrooke & Université Laval: Québec, Canada.
- Norman, F. A. (1989). [Review of *Teaching thinking skills: Mathematics*]. *Arithmetic Teacher*, 36(9), 35.
- Norman, F. A. (1989). [Review of *Games for MATH*]. *Arithmetic Teacher*, 36(9), 32.
- Norman, F. A. (1988). [Abstract and review of *Concrete can be abstract: a case study*]. *Investigations in Mathematics Education*, 21(3), 9-15.
- Jackson, C., Davis, E., Henderson, E., & Norman, S. (1985). Variables, Geometry and Structured Programming in a Logo Environment. In *Pre-proceedings for LOGO-85* (M. Palmgren, Ed.), MIT Press, Cambridge, MA (p. 124).

### Invited Conferences

Twenty-third Annual Conference of Mu Alpha Theta  
Brigham Young University-Hawaii, Honolulu, HI. August, 1993

Seventh International Congress on Mathematical Education  
Quebec City, Quebec. August 17 – 24, 1992.

Conference on the Learning and Teaching of the Concept of Function  
Purdue University. October 26 – 29, 1990.

Hawaii Conference on the Learning and Teaching of Algebra  
University of Hawaii at Manoa. January 11 – 15, 1989.

Sixth International Congress on Mathematical Education  
Budapest, Hungary. July 26 – August 4, 1988.

NCTM Research Agenda Project — Algebra Conference  
University of Georgia, Athens, Georgia. March 20 – 24, 1987.

### Conferences/Symposia Organized

- o Co-organizer, South Texas Mathematics Consortium 2000, San Antonio, TX. February 12, 2000.
- o Co-organizer, Southeast Analysis Meeting, UNC Charlotte (1991). [with the Analysis Group]
- o Chair and co-organizer of research pre-session symposium “Research in Calculus Learning” national meeting of NCTM (April, 1990). [with K. Prichard]
- o Co-organizer of UNCC Mini-Conference on the Use of Graphing Calculators in the Undergraduate Curriculum (March, 1990). [with T. R. Lucas]
- o Co-organizer for Conference for North Carolina Mathematics Educators (1988, 1989, 1990, 1991). [with K. Prichard & M. Leiva]

### Working Groups

- Methodologies for Assessing Teacher Change (NCRMSE at WCER)
- Algebra Working Group (NCRMSE at WCER)
- Students' Difficulties in Calculus (ICME 7, initiator)

### Invited Papers/Presentations/Workshops

- (2006, February). *Geometer's Sketchpad and Fathom*. Series of workshops for SWISD, San Antonio.
- (2005, Sept. – Dec.) *Technology for Algebra and Geometry*. Series of workshops for SWISD, San Antonio, TX.
- (2004, December). *An Introduction to Geometer's Sketchpad for the Middle Grades Mathematics Teacher*. Two workshop presentations for the Alamo District Council of Teachers of Mathematics, San Antonio, TX.
- (2004, October). *2000 Years of Trisections: From Archimedes to Galois*. Paper presented to Annual Georgia Council of Teachers Mathematics Conference, Eatonton, GA.
- (2004, October). *Elliptical Dartboards: An application of Pseudoconics*. Paper presented to Annual Georgia Council of Teachers Mathematics Conference, Eatonton, GA.
- (2004, September). *A Mathematical Buffet – Co-prime ribs, Quadrant fries, Riemann zeta, and a slice of  $\pi$* . Colloquium for students and faculty of the Departments of Mathematics, UTSA, San Antonio, TX.
- (2004, September). *Probability and the Riemann  $\zeta$ -function*. Biennial Mathematics Seminar presentation to students and faculty of Trinity University, San Antonio, TX.
- (2004, July). *Algebra Explorations with Geometer's Sketchpad*. Presentation for the 2004 CAMT Conference, San Antonio, TX.
- (2004, February). *Some Observations and Questions about a New Class of Plane Curves- The Pseudoconics*. Paper presentation at the 12th Annual South Texas Mathematics Consortium meeting, Laredo, TX.
- (2003, February). *The Tao of Mathematics*. Biennial Mathematics Seminar presentation to students and faculty of Trinity University, San Antonio, TX.
- (1999, October). *The Mathematics of Optical Phenomena*. 40th Annual Georgia Mathematics Conference, UGA Rock Eagle Conference Center, Eatonton, GA.
- (1999, September). *The Fundamentals of Fractals and Chaos*. Taft High School Academic Decathlon, San Antonio, TX.
- (1997, November). *Applications of Dynamic Geometry Software*. Carolinas Mathematics Conference, Charlotte, NC.
- (1996, November). *Software for Undergraduate Geometry Students*. International Conference on Technology in Collegiate Mathematics Teaching, Reno, NV.
- (1995, October). *Manipulatives for Algebra*, ACCD Conference on Teaching, San Antonio, TX.
- (1995, August). *Students Creating Mathematics: Computer Explorations*. Presentation for the 1995 CAMT Conference, San Antonio, TX.
- (1994, October). *Figurate Numbers, Diophantine Equations, and Generating Functions: A Mathematical Gumbo*. Paper presented at the Southern Regional Conference of the National Council of Teachers of Mathematics, Tulsa, OK.
- (1994, August). *Researching in Mathematics and Mathematics Education*. Talk given to participants of the Advanced Placement Institute in Mathematics, University of Texas at San Antonio.
- (1994, February). *Graphing Calculators in the Secondary Mathematics Classroom*. Workshop for secondary mathematics teachers of Edgewood ISD, San Antonio.
- (1993, November). *Art and Mathematics ... and the Renaissance*. Workshop given for Northeast Senior High Gifted/Talented Program, The Renaissance Era. Taft High School, San Antonio, Texas.
- (1993, August). *Figurate Numbers, Diophantine Equations, and Generating Functions*. Paper presented to the 23rd Annual Conference of Mu Alpha Theta, Brigham Young University-Hawaii, Honolulu, HI.

- (1993, January). *Implications of Research and Researching for Undergraduate Mathematical Education*. Paper presented at the Joint Meeting of the AMS-MAA. San Antonio.
- (1992, August). *Calculus for Non-Specialists: Implications from Recent Research*. Paper presented to subgroup III of Working Group 7 (Students' Difficulties with Calculus) at the 7th International Congress on Mathematical Education. Laval University, Québec Cité, Québec, Canada.
- (1992, August). *Recent Research in Calculus Learning*. Colloquium presentation to the MCSS faculty, University of Texas at San Antonio.
- (1992, April). *Cognitive Obstacles to the Learning of Calculus*. Colloquium presentation to the Mathematics and Education faculty, University of Iowa, Iowa City.
- (1992, March). *A Krutetskiian Framework for Cognitive Obstacles in Mathematics*. Colloquium presentation to the Mathematics and Education faculty, Louisiana State University, Baton Rouge.
- (1991, November). *Creative Computing Challenges*. Computer workshop for the Southeast Regional Conference of the NCTM (postponed from 1988 due to Hurricane Hugo). San Juan, Puerto Rico.
- (1991, November). *Research on the Learning and Teaching of Algebra*. Paper presented at Southeast Regional Conference of the NCTM. Baltimore, MD.
- (1991, October). *Teachers' Pedagogical Knowledge of Function: Aspects of a Research Methodology*. Paper presented at PME-NA XIII Research Pre-session. VPI, Blacksburg, VA.
- (1991, January). *Cognitive Obstacles to the Learning of Calculus and a Krutetskiian Perspective on Problem Solving in the Calculus* (by K. Prichard). Papers presented at the Joint Meeting of the AMS-MAA. San Francisco.
- (1990, October). *Teachers' Personal and Pedagogical Knowledge of the Concept of Function*. Paper presented at the Conference on the Learning and Teaching of the Concept of Function. Purdue University, West Lafayette, IN.
- (1990, April). *Aspects of Calculus Learning — Recent Research and Future Directions*. Panel presentation at the (AERA) Special Interest Group – Research in Mathematics Education. Salt Lake City, UT.
- (1990, April). *Teachers' Knowledge of Graphical Representation of Functions*. Symposium presentation at the (AERA) Special Interest Group – Research in Mathematics Education. Salt Lake City, UT.
- (1990, March). *Logo Explorations of Symmetries and Isometries*. Workshop for the Annual Meeting of the Virginia Council of Teachers of Mathematics. Charlottesville, VA.
- (1989, April). *Research in Algebra Learning: Implications for Postsecondary Mathematics Teaching*. Talk presented at the 67th Annual Meeting of the National Council of Teachers of Mathematics. Orlando.
- (1988, July/August). *Implications of Psycholinguistics in Mathematics Education Research*. Paper presented to the 6th International Congress on Mathematical Education, Budapest.
- (1987, May). *Perspectives of a Novitiate Mathematics Educator*. Presentation to the faculty and students of the Department of Mathematics Education, University of Georgia. MESA Colloquium Series, Athens.
- (1986, April). *A Look at a Generalized Form for the Locus of Vertices for Polynomials of One Real Variable*. Presentation to the faculty of the Department of Mathematics, University of North Carolina at Charlotte.
- (1986, February). *Creation and Exploration of Original Mathematics in the Secondary School*. Presentation to the Department of Mathematics Education, University of Georgia. MESA Colloquium Series, Athens.

### Contributed papers/Talks presented

- (2005, February). *The Art and History of Trisections: From Archimedes to Galois*. Presentation to K-12 Teacher Conference, Sam Houston State University, Huntsville, TX.
- (1999, July). *The Calculus of the Rainbow*. Western Regional NCTM Conference, Honolulu, HI.
- (1994, May). *Fermat, Wiles, and the Latest on the Last Theorem. Part II*. Seminar presentation to MCSS faculty and students, University of Texas at San Antonio.
- (1994, April). *Fermat, Wiles, and the Latest on the Last Theorem. Part I*. Seminar presentation to MCSS faculty and students, University of Texas at San Antonio.
- (1993, April). *Implications of Mathematics Education Reform for Teacher Preparation Programs*. Position paper presented at the AWG Pre-session of AERA, Atlanta.
- (1992, August). *A Krutetskiian Framework for the interpretation of cognitive obstacles: An Example from the Calculus*. Paper (with K. Prichard) presented to the 16th PME conference, University of New Hampshire, Durham.
- (1988, October). *Creative Mathematics - Creative Computing*. Talk presented at the Carolinas Conference joint meeting of NCCTM and SCCTM. Charlotte, NC.
- (1988, April). *Some Aspects of Doubly-Figurate Numbers*. Paper presented at the 67th Annual Meeting of the mathematical Association of America, Southeastern Region, Furman University, Greenville, SC.
- (1988, March). *The Micro in the Classroom: Explorations into Students' Creation of Mathematics*. Workshop given at the Regional meeting of NCTM, Atlanta, Ga.
- (1988, March). *Microcomputer Explorations in Algebra, Analytic Geometry, and Calculus*. Talk given at the 16th Annual Western Regional Mathematics Conference of the NCCTM, Asheville.
- (1987, March). *What Recent Research in Algebra Learning Says to Teachers*. Talk given at the 15th Annual Western Regional Mathematics Conference of the NCCTM, Charlotte, NC.
- (1987, April). *Students' Perceptions of and Operations with Variable Complexes*. Paper presented at the 66th Annual Meeting of the mathematical Association of America, Southeastern Region, Armstrong College, Savannah, Georgia.
- (1987, July). *A Psycholinguistic Perspective of Algebraic Language*. Paper presented at the 11th International Conference for the Psychology of Mathematics Education, Montreal.
- (1986, October). *Computer Assisted Exploration of Non-routine Algebra Problems*. Paper presented at the Annual Meeting of the Georgia Council of Teachers of Mathematics, Rock Eagle, Georgia.
- (1986, October). *Is a Square a Rectangle?*. Paper presented to the Annual Meeting of the North Carolina Council of Teachers of Mathematics, Raleigh, NC. (with C.S.Kay)
- (1986, October). *Using Computers to Explore Polynomials, Conics, and Other Curves*. Paper/Workshop presented at the Annual Meeting of the NCCTM, Raleigh, NC.
- (1986, September). *Students' unitizing of variable complexes in algebraic and graphical contexts*. Paper presented at the Eighth Annual Meeting of PME-NA, Michigan State University, East Lansing.
- (1986, April). *Locus of vertices and higher order critical points for polynomials*. Paper presented at the Southeastern Sectional Meeting of the Mathematical Association of America, Auburn University, Auburn, Alabama.
- (1985, October). *Notes on Generalized Conics*. Paper presented at the Annual Meeting of the Georgia Council of Teachers of Mathematics, Rock Eagle, Georgia.
- (1985, July). *Variables, Geometry and Structured Programming in a Logo Environment*. International Conference Logo-85, MIT, Cambridge, Massachusetts. (with Jackson, C., Henderson, E. & Davis, E. J.)
- (1985, April). *Investigating Pseudoconics - An Opportunity for Students to Explore and Create New Mathematics*. Paper presented at the Southeastern Sectional Meeting of the Mathematical Association of America.

ica, Wake Forest University, Winston-Salem, North Carolina.

(1984, October). *Calculators in the Classroom*. Paper/Workshop presented at the Annual Meeting of the Georgia Council of Teachers of Mathematics, Rock Eagle, Georgia.

### **Other Professional Activities**

Director, *San Antonio Virtual Interactive Geometry Exhibit*, Institute for Texan Cultures

Associate Editor, *Southwest Interactive Geometry Bulletin*, Southwest Research Institute, 2004 – present.

Consultant/Textbook Reviewer for: Texas A&M-Commerce Geometry Project, Prentice-Hall, Addison-Wesley (1997 – present)

Member, Editorial Board *Journal of Computers in Mathematics and Science Teaching* (former)

Advisory Board, Texas Math/Science Hotline (Texas Society for Biomedical Research)(1995-1999)

Referee for *Journal of Computers in Mathematics and Science Teaching*

Referee for *Journal for Research in Mathematics Education*

Referee for *Mathematics Teacher*

Reviewer and referee for *Arithmetic Teacher/ Teaching Children Mathematics*

Abstractor/Reviewer for *Investigations in Mathematics Education* (ERIC)

Reviewer for NCTM's Research Interpretation Project

Member, Math/Science Advisory Council for Edgewood ISD Math/Science Learning Academy

Faculty Consultant, AP Calculus Exams (Clemson University: 1990, 1992, 1993, 1995, 1998; Colorado State University, 1999)

Chair, Registration, Carolinas Conference (Charlotte, 1991)

Program Committee 20th Annual State Mathematics Conference, NCCTM (November, 1990)

Visiting Lecturer for area high schools

Judge for local and regional math/science fairs

Member of State SACS Evaluation Team (1988)

Evaluation committee for Georgia Plan EESA grant proposals (1985,1986)

Evaluation committee for candidates for the Governor's Honors Program (1985)

## Teaching Experience

### University of Texas at San Antonio

Department of Mathematics

(Graduate Faculty)

#### **Undergraduate**

MAT 1067 – College Algebra (MIP section)

MAT 1093 – Precalculus (MIP section, Honors)

MAT 1143 – Essential Elements

MAT 1214 – Calculus I (& Honors)

MAT 1223 – Calculus II (& Honors)

MAT 2213 – Calculus

III (&Honors)

MAT 2243 – Foundations of

Mathematics MAT 3123 –

Fundamentals of Geometry

MAT 3213 – Foundations

of Analysis MAT 3233 –

Modern Algebra

MAT 3243 – Calculus for

Applications

MAT 3613 – Differential

Equations MAT 4113 –

Computer Math Topics

MAT 4123 – History of

Mathematics MAT 4233 –

Modern Abstract Algebra

MAT 4253 – Number

Theory

MAT 4263 – Geometry

MAT 4913 – Independent study (various)

MAT 4953 – Special Studies in Mathematics (various)

MAT 4993 – Honors Research

HON 3113 – Honors Seminar: Excursions into Mathematics

#### **Graduate**

MAT 5003 – Modern Mathematics for Teachers



MAT 5013 – Computers for Mathematics Teachers

MAT 5023 – Problem Solving Seminar

MAT 5043 – Advanced Euclidean and Non-Euclidean Geometry  
MAT 5103 – Introduction to Analysis

MAT 6953 – Independent study (various)

MAT 6963 – Topics in Mathematics Education (various)  
MAT 6973 – Special

Topics in Mathematics (various)

MAT 6983 – Master's Thesis

Thesis advisor (Liz Lennon, Farrah O'Neill-Pacheco)

Honors thesis advisor (Julie Cunningham, Amy Winburn, James Ku)

RCMS mentor:

S. Reyes – Loci of Critical Points of Polynomials  
– Fermat's Last Theorem  
– Combinatorial Applications of Generating Functions

E. Roberts – A Number Theoretic Approach to Counting Subgroups of  $D_n$

AMP mentor:

Shahla Zaroomy – Applications of Generating Functions

Numerous engagements judging at local, regional and the Exxon-Mobil Texas Sciences and Engineering Fair (1995--)

University of North Carolina at Charlotte

## Department of Mathematics (Graduate Faculty)

MAED 2101, 2102, 2103, 3103, 3105, 3141, 5104, 5105, 5141, 5171

MATH 1101, 1104, 1141, 2171, 6101, 6102, 6104, 6106, 6118

Teacher training course for departmental teaching assistants

MAED	{	content and methods for the elementary school teacher algebra
		content and methods for the middle school teacher geometry
		content and methods for the middle school teacher
		geometry content and methods for the secondary school teacher
		problem solving and computers in the elementary curriculum
		problem solving and computers in the secondary curriculum
		secondary curriculum and methods

MATH	{	college algebra
		trigonometry
		calculus
		differential equations
		senior theses
		non-Euclidean geometry (graduate)
		real analysis (graduate)
		calculus from an advanced viewpoint (graduate)
		modern algebra (graduate)
		mathematical computing (graduate)

## Mathematics and Science Education Center

Summer Teacher Institutes (Topics in Solid Geometry; Geometry Without Proofs)

Summer Scholars Pre-College Program (Calculator Intensive Pre-Calculus)

Saturday Academy Pre-College Program (Introduction to Calculus Concepts)

Summer Ventures Program for High School Students (Topics in Algebra and Analysis;  
Number Theory)

## College of Education

supervision of preservice secondary mathematics student teachers

content observation of middle school mathematics student teachers

University of Georgia

## Department of Mathematics

college algebra  
 analytic geometry and trigonometry  
 precalculus and calculus for business students  
 topics in discrete mathematics

## Department of Mathematics Education

content and methods for the elementary school teacher  
 middle school content and methods  
 mathematics for secondary students  
 content and methods for the general Mathematics classroom  
 instruction in microcomputers for the classroom  
 observation and evaluation of field component of methods classes

Special Studies – developmental algebra

Brenau College

college algebra

Athens Academy

pre-algebra	general mathematics	algebra I & II
advanced algebra	geometry	trigonometry
analytic geometry	analysis	

Other instructional activities

- Approximately 30 presentations per year since 2005 at SAVIG exhibit at the Institute of Texan Cultures
- Numerous classroom presentations in secondary and elementary schools in San Antonio and Charlotte
- Chair and member of masters' students examination committees; member of two doctoral dissertation committees
- Director of senior theses in Mathematics
  - P. Poplin - Pseudoconics
  - E. Ledford -Aspects of Complex Analysis
  - S. Laudé - Continued Fractions
  - A. Motsinger - Goldbach's Conjecture
  - M. Bigham - Generating Function Solutions of Diophantine Equations
- Small group and individual tutorial instruction involving students of diverse ability levels (gifted, remedial, etc.) spanning the entire spectrum of mathematical coursework from kindergarten to graduate level.
- Instructor in UGA Computer Camp for local schoolchildren (1983, 1984)
  - Co-director of UGA Computer Camp (1985)

## Research/Development/Grant Activities

Co-PI, 2013, NSF, Transforming UG Engineering Programs, (approx.. \$200,000)(submitted)  
 Co-PI, 2011, TEA, Dual Credit Math Teacher Academy, (approx., \$250,000) (unfunded)  
 Co-PI, 2011, NSF, San Antonio Math & Science Education Partnership, (approx..\$10,000,000) (unfunded)  
     Planning grant of approx.. \$150,000 was funded  
 Co-PI, 2009, UT System, Transforming Engineering Program, (approx.. \$247,000) funded  
 Principal Investigator, 2007 Teacher Quality Grant: SAMC Geometry (approx\$86,000)  
 Principal Investigator, 2006 Teacher Quality Grant: Geometry (THECB)(approx. \$80,000)  
 Principal Investigator, 2005 Teacher Quality Grant: Geometry (THECB)(funded: approx. \$80,000)  
 Co-PI, 2003 Teacher Quality Grant (with B. Travis) (funded)  
 Principal Writer and Instructor, UIW Eisenhower proposals (PI: H. Zhou, University of the Incarnate Word) 1996, 1997, 1998, 1999 (all funded approx. \$70,000 per year)  
 Curriculum consultant, Office of Naval Research grant (PI: B. Travis, UTSA)  
 Curriculum consultant, NSF grant (PI: S. Ganter, Worcester Polytechnic)  
 Evaluation consultant, NSF grant (PI: J. Selden, Tennessee Tech)  
 Co-conducted evaluation and analysis of survey for the Georgia CTM (with E.J. Davis)  
 1999 UTSA Technology Grant—Mathematics Retention Project/Phase I (with B. Travis)  
 1995 Eisenhower (THECB)—UTSA Institute for MS Mathematics Teachers (funded: \$49,817)  
 1995 Eisenhower (THECB)—UTSA Institute for Elementary Mathematics Teachers  
 1994 Eisenhower (THECB)—UTSA Summer Institute for Elem. Math. Teachers (funded: \$49,849)  
 NSF—Women and Girls in Science and Mathematics (with La Vernia Schools)  
 Apple Computers (with Northside ISD) — not funded  
 Fund for Improvement of Post-Secondary Education (with D. Royster, K. Prichard, & N. Schoeps) – favorably reviewed but not funded  
 Wisconsin Center for Education Research – 1989 (funded: \$3000)  
 UNCC Faculty Research Grant – 1989 (funded: \$2850)  
 Using Technology to Improve the Teaching of Calculus: Submitted to NSF [with D. Royster & K. Prichard]  
 Research consultant for Children’s Television Workshop (national evaluation of 3-2-1 Contact) (with S. Wagner)

### Other Grant Proposals

NSF ILI Technology Grant (with D. Gokhman, et al.) 1999 (not funded)  
 Distinguished Visiting Scholars (with K. Prichard and M. Leiva) – 1988 (funded: \$ 16,000)  
 Distinguished Visiting Scholars (with K. Prichard and M. Leiva) – 1989 (funded: \$ 12,500)  
 Distinguished Visiting Scholars (with K. Prichard and M. Leiva) – 1990 (funded: \$3,000)  
 Distinguished Visiting Scholars (with K. Prichard and M. Leiva) – 1991 (funded: \$6,000)

## Curriculum Development

*Introduction to Analysis.* Notes and curriculum guide for graduate level real analysis course.  
*Modern Algebra: Elementary Field Theory and Its Applications.* Notes and curriculum guide for graduate level algebra course.  
 $\beta$  site instructor for Oregon State University Calculus Project curriculum  
 Curriculum proposal for MATH 1100 - College Algebra with Probability (1988)  
 Chair of MATH 1100 reform committee

*Fact-ori-al-s! Permutations*© – Apple software tutorial/practice utility  
*The Surveyor*© – software for the analysis and display of data collected from finite forced-choice survey instruments (IBM)  
 Developer of criterion tests for the Educational Testing Service to be used as a supplement to an elementary text book series  
*Logo Handbook for Teachers* - (with E. Davis, J. Helms & R. Jensen) Department of Mathematics Education, University of Georgia

#### Curriculum and Materials Grants

UNCC Committee on General Education – 1989 (funded: \$2000)  
 Special Lectures (via COGE) – 1989 (funded: \$ 1000)  
 UNC Charlotte CID Grant — 1991 (funded: \$5,300) [with K. Prichard, D. Royster]

#### **Administrative responsibilities/Committee memberships:**

Department Undergraduate Advisor of Record (2009--)

Graduate Advisor for MS in Mathematics (2003 – 2008)

Secretary, College of Sciences Faculty Forum (2006 – 2010)

Faculty Senate Academic Policy and Requirements Comm., (2010--)

Faculty Senate HOP Committee (2005 – )

Faculty Senate Ad hoc Committee re Dr. Manuel Berriozabal (2005 – )

Faculty Senate Academic Freedom and Tenure Committee (2005 – 2009)

Faculty Senate, member (dept. rep. 2003–2005), (ex-off. 2006-2010)

Executive Committee, Faculty Senate (2003–2005)

Chair (Spring), Faculty Senate Ad Hoc Committee on Administrator Evaluation (2004)

Faculty Senate Governance Committee (2004)

College Academic Policy Committee (2003-2004)

Secretary: Mathematics Division Faculty Forum, UTSA (1993–1999)

**Chair:** COSE Academic Policy and Curriculum Advisory Committee(1994–1996)

Division Graduate Studies Committee (2000–2002)

Division Comprehensive Examination Committee (1996–1997; 2000– )

Faculty Senate Committee on Academic Policy and Requirements (2000-2002)

Academic Affairs and Faculty Quality Comm., UT SysFAC (co-Chair) (2006-2010)

Research Subcommittee, UTSA Tobacco-Free Campus Taskforce (2012-2013)

#### **Member:**

Advisory Board for the *Paisano* (independent student newspaper) (2009--)

President's Advisory Council for the State Employees Charitable Campaign (2011--)

COS Computing Committee (2009—2010)

Dean's Executive Council (2007--)

AAA for numerous COS search committees (CS, Biology, Chemistry)

Institute of Texan Cultures Faculty Advisory Committee (2012 --)

UTSA Tobacco-Free Campus Taskforce (2012–2013)

UTSA Teacher Education Advisory Committee (2011--)

University Center Advisory Committee (2010 --)

UT System Faculty Advisory Council (2006-2010)

University Taskforce on Student Retention (3 subcommittees: 2006 – 2007)

University Extended Education Committee, UTSA (1993– )

University Athletics Committee, UTSA (1999–2002)  
 UTSA Faculty Senate and University Assembly (1997–2002)  
 Committee on Academic Policy and Requirements (1997–2002)  
 UTSA representative to the Urban Systemic Initiative Task Force (1995–2002)  
 Joint MCSS-C&I Search Committee, UTSA (1994)  
 University Teacher Education Committee, UTSA (1993–)  
 MAT Graduate Steering Committee, UTSA (1994–1996 )  
 Comprehensive Examination Committee, UTSA (1994–1996)  
 Committee to Develop an Area of Specialization in Advanced  
 Interdisciplinary Studies in the Arts and Sciences, UTSA (1994–1996)

Faculty sponsor/advisor for Alternative Spring Break community service projects:

2006: Emergency Communities project, New Orleans  
 1999: Kickapoo Indian Reservation, Eagle Pass, TX  
 1998: US National Park Service, Painted Desert, AZ  
 1997: US Forest Service, Colorado Grasslands National Monument, CO

Faculty advisor for UTSA Math Club/Chapter of Pi Mu Epsilon (Nat'l Collegiate Mathematics Society)  
 (2005 – 2009)

Faculty advisor for Alpha Phi Omega Service Fraternity, UTSA (1997– )

Faculty advisor for the Ecology Society, UTSA, (1997–1999)

Faculty advisor for the Student Environmental Action Coalition (1995)

Activities elsewhere:

Graduate Coordinator for Mathematics Education, UNCC (1991– 92)

Department Calculus Reform Committee, UNCC (1989–92)

Department Advisory Committee, UNCC (1988–90)

Department Curriculum Committee, UNCC (1987–88, 1990–91)

Department Graduate Committee, UNCC (1988–89, 1991–92)

High School Mathematics Contest Committee, UNCC (198–92)

Chair: 1989–1990

Faculty advisor for *T.R.E.E.* (student environmental club), UNCC (1990–92)

College Committee for Interdisciplinary Mathematics/Science Major, UNCC (1988–90)

Program and Policy Committee of the Math/Science Education Center, UNCC (1988–92)

Faculty Library Advisory Committee, UNCC (1987–89)

**Professional Affiliations**

*Texas Faculty Association*(1994– )

(Secretary – San Antonio Chapter, 1997-1998)

*American Association of University Professors*

(Secretary – UNCC Chapter, 1989-1990)

(Vice President – UNCC Chapter, 1988-1990)

*American Educational Research Association*

Also: *SIG/RME*

*American Mathematical Society*

*International Group for the Psychology of Mathematics Education*

Also: *North American Chapter*

*Mathematical Association of America*

*National Council of Teachers of Mathematics*

Also: *Georgia Council; North Carolina Council; and*

*Mathematics Education Student Association* (University of Georgia)

*New York Academy of Sciences*

*School Science and Mathematics Association*

*Sigma Xi*