
HOLLY PETERS HIRST

PROFESSOR EMERITA, MATHEMATICS
APPALACHIAN STATE UNIVERSITY
Boone, North Carolina 28608
<https://hirsthp.github.io/>

EDUCATION

The Pennsylvania State University, University Park, Pennsylvania
Ph.D. - Mathematics, Numerical Analysis and Optimization
M.A. - Mathematics
Temple University, Philadelphia, Pennsylvania
B.A. - Mathematics, Magna Cum Laude, Phyllis Zayon Steinberg Award for Excellence in Mathematics

ACADEMIC EXPERIENCE

Appalachian State University, Boone, North Carolina
Professor Emerita, Department of Mathematical Sciences, 2024—
Professor, Department of Mathematical Sciences, 2004-2024
Director, Mathematics Graduate Program, 2022-2023
Co-Director, Mathematics Graduate Program, 2014-2020, 2022
Associate Dean for Research and Graduate Studies, Cratis D. Williams Graduate School, 2005-2013
Associate Professor, Department of Mathematical Sciences, 1998-2004
Director, Mathematics Graduate Program, 1998-2005
Director, SACS-COC University Self-study for Reaffirmation of Accreditation, 1999-2002
Acting Assistant Dean, College of Arts and Sciences, 1998-1999
Assistant Professor, Department of Mathematical Sciences, 1990-1998
The Ohio State University, Columbus, Ohio
Assistant Director of Academic Computing, 1988-1990
Instructor, Department of Mathematics, 1987-1988, 1989-1990

HONORS

Appalachian State University Excellence in Teaching Award, University of North Carolina Board of Governors, 2019
North Carolina Council of Teachers of Mathematics Innovator Award, 2013 (with D. Crocker, former editors of *The Centroid*)
Appalachian State University Cratis Williams Graduate School Academy of Outstanding Mentors, 2013
Appalachian State University Plemmons Leadership Medallion, 2007
Appalachian State University College of Arts & Sciences James R. Smith Outstanding Service Award, 2003
First Prize for Quantitative Literacy, 1996-1997 Annenberg/CPB Innovative Uses of Technology in Mathematics Service Courses Awards Competition, 1996 (with J. Bennett, N. Sexton, J. Smith, W. Sprunt)
Appalachian State University Alumni Association Outstanding Teaching Award, 1995
Undergraduate Computational Science Education Award, U.S. Department of Energy, 1995
Nominee, Richard Henson Outstanding Advisor Award, College of Arts and Sciences, Appalachian State University, 2020
Nominee, Appalachian State University Arts & Sciences Academy of Outstanding Teachers, 1992, 1994, 1996, 2003

PUBLICATIONS

The Old Man and the Tree: A Real Application of Trigonometry, *The Centroid* **50**(1), 2024
Using Leslie Models Built from Scientific Data to Illustrate Matrix Arithmetic, *The Centroid* **47**(1), 2021
Revising General Education Math Courses with Partner Discipline Input, *PRIMUS* **29**(9), 2019 (with T. Palmer)
Tessellations: Tiling the Plane, *The Centroid* **44**(1), 2018 (with M. Barrier)
Motivating Computational Science Through Systems Modeling, *JOCSE* **9**(1), 2018
Introducing Students to the Modeling Process, *The Centroid* **41**(1), 2016 (with T. Abel, A. Baird, T. Salinas)
The Racing Game – A Probability Activity, *The Centroid* **40**(2), 2015
Six entries in *The Encyclopedia of Mathematics and Society*, S. Greenwald and J. Thomley, Eds., Salem Press, 2012 (*Predator-Prey Models; Income Tax; Sudoku; Home Buying: Mortgages & Amortization; Forest Fires; Musical Scales & Tuning*)
Functions as Graphs: Depth Versus Volume in a Vase, *The Centroid* **38**(1), 2012
How Do You Know? Using Mathematics to Make Decisions [course text for MAT 1010], Kendall-Hunt, 1996, 1998, 2000, 2003, 2005, 2011 (Co-Editor: J. Smith; with: J. Bennett, N. Sexton, J. Smith, W. Sprunt)
Sudoku – Serious math? Yes! *The Centroid* **33**(1), 2007
Increasing the Relevance to and Engagement of Students in a Quantitative Literacy Course, in *Current Practices in Quantitative Literacy*, *MAA Notes #70*, R. Gillman, Ed., Mathematical Association of America, 2006 (with: S. Greenwald)
Using the Historical Development of Predator-Prey Models to Teach Mathematical Modeling, in *From Calculus to Computers: Using the Last 200 Years of Mathematics History in the Classroom*, Mathematical Association of America, 2005
A Primer for Logic and Proof [course text for MAT 2110], Appalachian State University, 2004 (with J. Hirst)
A Web-Based, Calculator-Skills Tutorial and Self-Test for General Chemistry Students. *The Chemical Educator* **6**, 2001. (with: R. Gotwals, R. Panoff, N. Pienta, H. Thorp)
Math Modeling with Stella, in *Proceedings of the Thirteenth International Conference on Technology in Collegiate Mathematics*, Addison Wesley, 2001

- Fractals in the Classroom*, in Proceedings of the Eleventh International Conference on Technology in Collegiate Mathematics, Addison Wesley, 2000
- Incorporating Modeling into Undergraduate Courses*, in Proceedings of the International Conference on Teaching Mathematics, Samos Greece, John Wiley and Sons, Inc., 1998 (with J. Hirst)
- A Laboratory Course in Mathematics for Liberal Arts Majors*, in Exemplary Programs in Introductory College Mathematics, Corporation for Public Broadcasting, 1998 (with J. Smith)
- Writing In College Algebra Using Linear Programming Projects*, in Proceedings of the Ninth International Conference of Technology in Collegiate Mathematics, Addison Wesley, 1998 (with J. Smith)
- Bounding the Roots of Polynomials*, *The College Mathematics Journal* **28**(4), 1997 (with W. Macey)
- Investigating Eigensystems in Introductory Linear Algebra*, *The Maple Technical Newsletter* **2**(2), 1995 (with W. Bauldry)

GRANTS AND OTHER FUNDING

- MAA TENSOR Grant, *A Vertically Integrated Workshop for Women*, 2005-06 (with S. Greenwald)
- NSF CCLI-National Dissemination Grant, *National Computational Science Institute*, \$2.7 Million, 2001-05 (with R. Panoff, E. Jacobsson, D. Stevenson)
- NCSA EdGrid Grant, *Carolinas Middle School Math Initiative*, \$240,000, 2000-02 (with R. Panoff)
- Shodor Foundation Grant, *Middle Grades Teacher Preparation and Enhancement Project*, \$36,000, 2001-03 (with G. Foley, P. Schram, M. Searcy, D. Wasman)
- Appalachian State University Academic Affairs Computing Initiative Grants, *Experiment in Computer Enhanced Learning Project (EXCEL)*, 1998-99; *Using Web-CT for Supplemental Course Materials in Liberal Arts Mathematics and Calculus*, 1999
- NSF Undergraduate Faculty Enhancement Grant, *The Shodor Computational Science Institute*, \$370,000. 1998-2000 (with R. Panoff)

WORKSHOPS TAUGHT

- XSEDE-The Extreme Science and Engineering Discovery Environment Program, *Computing MATTERS* Weeklong Workshops (with R. Panoff): University of Nebraska, Jul 2015; Oklahoma State, May 2016; Boise State U, Jun 2016
- Using Sage as a Tool for Mathematics Investigation*, Three Day Workshop 2011 (with N. Calkin, D. Warner): SuperComputing'10, Nov 2010; SuperComputing'11, Nov 2011
- Preparing Mathematicians to Educate Teachers (PMET) Initiative, Mathematical Association of America
- *Teaching Mathematics for Middle Grades Mathematics Concentrators*, Weeklong Workshop (with G. Foley, G. Kader, S. Rachlin, M. Searcy): ASU, May 2004, Jun 2005
 - *Teaching Middle Grades and Secondary Mathematics for Teachers*, Half-Day Workshop: JMM, Jan 2004 (with J. Narayan); International Conference on Teaching Mathematics with Technology, Oct 2004 (with M. Searcy)
 - *Teaching Mathematics for Elementary Education Majors*, Weeklong Workshop (with S. Beckman-Kaziz, D. Royster, M. Searcy): ASU, Aug 2003
- Mathematics Education Leadership Training (MELT) Program, Appalachian State University
- *Matrices in 4th Level Math Courses*, Online Workshop, Jul 2020
 - *Middle Grades Mathematics on the Web and in Print*, Weeklong Workshop (with M. Searcy): Jun 2001, Jun 2002, Jun 2003
- National Computational Science Institute (NCSI) Workshops, Shodor Education Foundation
- *Computational Science, Modeling and Simulation*, Weeklong Workshops: ASU, Jun 2002; Wofford U, Feb 2003 (with R. Panoff); UAB, May 2003 (with L. Bievenue); High Point U, Jul 2003 (with D. Warner); U Arkansas at Little Rock, Jul 2003 (with R. Panoff); Embry-Riddle Aeronautical U, Jun 2004 (with R. Panoff); SDSU, Aug 2004 (with R. Panoff)
 - *Introduction to Computational Biology*, Weeklong Workshops (with E. Marland, T. Weisstein): Ohio Supercomputer Center, Jun 2004, North Carolina A&T, Jul 2004
 - *Computational Science* (specific titles vary), Two- to Four-hour Workshops: SuperComputing'01, Nov 2001 (with G. Love, S. Ragan); Grace Hopper Conference for Women in Computing, Oct 2002 (with A. Shiflet); SuperComputing'02, Nov 2002 (with R. Allen); Southeastern SIAM Meeting, Mar 2003 (with D. Warner); Winston-Salem State U, Mar 2003; SuperComputing'03, Nov 2003; SuperComputing'04, Nov 2004 (with E. McNelis)
 - *National Computational Science Leadership Program*, Two Week Workshop, NCSA, July 2002 (with E. Gentry, R. Panoff)
- Shodor Computational Science Institute Undergraduate Faculty Development Workshops, Shodor Education Foundation
- *Computational Science and Modeling*, Week-long Workshops (with R. Panoff, D. Stevenson, D. Warner), North Carolina Central U, July 1998; ASU, July 1999, July 2000, June 2001

INVITED PRESENTATIONS

- Teaching Modeling using Predator-Prey Models*, Southeastern MAA and SIAM Joint Meetings, Mar 2003
- Calculator Numerical Methods*, Greater Spartanburg Area Mathematics Colloquium, Feb 2003
- Mathematical Modeling and Quantitative Reasoning*, Plenary Address, SuperComputing'02, Nov 2002
- Topics in Quantitative Literacy: Writing, Technology, Applications*, NCTM Southern Regional Conference, Jun 1999 (with J. Smith)
- Quantitative Literacy as Core Mathematics*, Sam Houston State University, Huntsville TX, Feb 1998

OTHER PRESENTATIONS

Using Real Applications to Motivate Matrix Computations, NCCTM, Feb 2022
New 4th Math Courses in NC, NCMATYC, Mar 2021
The MA Program in Math at Appalachian, NCMATYC, Mar 2019 (with R. Gosky)
Designing a Computational Mathematics Course for Math Majors, JMM, Jan 2019 (with G. Rhoads) – Lead presentation in MAA Contributed Paper Session coordinated with G. Rhoads
Bipartite Graphs, Group Membership, and Linear Algebra, NCMATYC, Mar 2018
Developing Student Interest in Computation Through the Use of Modeling Tools, International Conference on Computational Science, June 2017
Rate of Change and Modeling with Systems Modeling Tools, NCCTM, Oct 2016; NCMATYC, Mar 2017
Report on the Integrating Modeling into Secondary and Post-Secondary Classrooms Project, NC Ready for Success State Math Summit, Sep 2014 (with T. Salinas, T. Abel)
Field Guide to Functions with Help from JAVA, NCMATYC, Mar 2005; ICTCM, Oct 2002
Computational Science and K-12 Education, SIAM Meeting on Computational Science, Feb 2005
Quantitative Literacy as an Alternative to College Algebra, JMM, Jan 2002
Using JAVA Applets to Teach Probability, Geometry, Function and Number Concepts, JMM, Jan 2002
Project Interactivate - Interactive Web-based Activities for Middle Grades Math, NCCTM, Oct 2001
Incorporating Modeling into Mathematics Courses, NCCTM, Oct 2001
Fractals in the Liberal Arts Classroom, JMM, Jan 2001
Interactivating Middle School Mathematics, ShowMe Conference on Middle School Math Teacher Preparation, May 2000
Web-Based Homework and Quizzes, JMM, Jan 2000 (with J. Smith, J. Hirst)
Environmental Mathematics in a Liberal Arts Class, JMM, Jan 2000 (with J. Smith)
A Laboratory-Based Liberal Arts Math Course (MAT 1010), AMATYC- 1997, ICTCM – 1997, 1996, 1994, 1993; NCCTM - 1997, 1994; AMS – 1999, 1997, 1994, 1993; Southeast Section of MAA - 1997, 1995 (many with J. Smith)
Teaching Techniques of Proof, JMM, Jan 1999; Southeastern Section Meeting of the MAA, Apr 1999 (with J. Hirst)
Fractals in the Classroom, ICTCM, New Orleans LA, Nov 1998
Incorporating Modeling into Undergraduate Courses, International Conference on Teaching Mathematics, July 1998 (with J. Hirst)
Applying Technology in Pure Mathematics Courses for Undergraduates, International Conference on Teaching Mathematics, July 1998 (with J. Hirst)
An Honors Course in Mathematics for Liberal Arts Majors, Southeast Section Meeting of the MAA, Mar 1998
Fractals in the High School and College Algebra Classroom, ICTCM, Nov 1997
Incorporating Statistics into a Quantitative Literacy Course, Southeast Section of the MAA, Mar 1997 (with J. Smith)

TEACHING / MENTORING

Undergraduate Courses Taught: Intro to Math; College Algebra; Business Math with Calculus; Intro to Computer Science; PreCalculus; Calculus 1, 2, 3; Computational Math; Linear Algebra; Intro to Logic and Proof; Modern Algebra; Differential Equations; Applications of Math; Math Modeling; Junior Honors Seminar (Dunham’s Great Theorems of Math; Casti’s Five Golden Rules; Math of the last 100 Years Through the Gibbs Lectures); Operations Research; Numerical Methods

Graduate (Master’s Level) Courses Taught: Linear Algebra; Math Modeling; Numerical Analysis; Numerical Linear Algebra; Operations Research; Nonlinear Optimization; Graduate Teaching Seminar; Graduate Teaching Apprenticeship; Product of Learning

Graduate Capstone/Directed Research: Andrew Blevins, Jeanine Lynch, Melissa Mogensen, Cindy Kotseos, Natasha Mabe, Marie Murphy, Kenneth Jones, Warren Colavito, Julia Butler, Karlie Neigel, Jose Salazar, Travis Taylor, Claire Claiborne

Master’s Thesis: Thomas Keener

Senior Honors Thesis: Briquelle Martin, Wyatt Andreson, Anton Hengst, Anna Jenkins, Jayne Hollar

Senior Capstone: Lilly Xiong, Tessa Belk, Tim Wilkie, Sidney Anderson, Jessica Hawks, Matthew Hefner, Hailey Howett, Katie Pryor, Blake Shook, Graham Tobin, Matthew Young, Caity Johnson, Danielle Gilmore, Forrest Myers, John LeBlanc, Jordan Greene, Cassidy Borum, Seth Harrison, Sophia Elhag, Andrew Kinneberg, Zoe Robino, Samantha Barnhardt, Cindy Candelario Jose, Brandon Chauncey, Remy Duplantis, Deborah Nowak, Hayden Switzer, Libby Young

SERVICE

Regional / National:

- Board of Directors, Shodor Foundation, 1994-2024
- Steering Committee, Special Interest Group on High Performance Computing Education (SIGHPCedu), ACM, 2015-2020 (Vice Chair 2016-2017)
- Outstanding Master’s Thesis Selection Committee, Conference of Southern Graduate Schools, 2012-2014
- Undergraduate Computational Science and Engineering Education Advisory Committee, US Dept of Energy, 1994-1996

- SACS COC Reaffirmation Committees: Offsite Reviews 2005, 2010, 2013, 2018, 2022, 2023, 2024 (Committee Chair in 2022, 2023, 2024); Onsite Reviews 2001, 2013, 2020 (Chair in 2020)

Disciplinary:

- Webmaster for the North Carolina Council of Teachers of Mathematics (NCCTM), 2015-2023
- Editor for *The Centroid*, The Journal of the NCCTM, 2003-- (co-editor with D. Crocker from 2010-2022)
- Committee on the Mathematical Education of Teachers (COMET), MAA, 2008-2013
- State Coordinator for the Preparing Mathematicians to Educate Teachers (PMET) Initiative, MAA, 2003-2006 (with D. Royster)
- Co-Chair, Education Program, Supercomputing'04, Pittsburgh PA, 2004 (with R. Panoff); SuperComputing'03, Phoenix AZ, 2003 (with S. Lathrop)

Departmental:

- Chair, Actuarial Science Faculty Search Committee. 2023-2024
- Assessment Coordinator, 2022-2024
- Chair, Distinguished Professor of Math Education Search Committee, 2022
- Director, MA Mathematics Program, 1998-2005, 2013-2020 (co-director with R. Gosky), 2022
- Post-tenure Review Committee, 2015-2018, 2020-2023
- Coordinator, Product of Learning Committee, 2014-2024
- Chair, Applied Math Faculty Search Committee, 2020-2021
- Department Personnel Committee, 1995-2007, 2001-2004, 2014-2016, 2018-2020
- Graduate Program Assessment Committee, 2014-2024
- Co-Director, Mathematics Education Leadership Training (MELT) Program (with D. Crocker), 2004-2005
- Academic Advisor, average load 8 students per year, 1995-05, 2014-2024
- Math Lab Tutor Room Coordinator, 1994-2005
- Department Curriculum Committee, 2003-2005
- Math Club Advisor, 1992-1998

College and University (as faculty):

- Graduate Academic Policies and Procedures Committee 2014-2017, 2021-2024; Chair 2022-2024
- Chair, Scholarship Advisory Council, 2014-2023
- Chair, RCOE Dean Review Reading Committee, 2018-2019
- Distance Education Taskforce; Chair of Academic Oversight, Effectiveness and Integrity Subcommittee, 2017
- Arts and Sciences Online Teaching and Learning Task Force, 2014-2015
- Chair, Overseas Education Committee, 2010-2014
- Chair, Health College Creation Task Force, 2008-2009
- Chair, Cultural Affairs Advisory Committee, 1995-1998; Member, Arts and Cultural Programs Committee, 2001-2023
- Director, University Reaccreditation Self-Study, 1999-2002
- Academic Policies and Procedures Committee, 1998-2004
- Faculty Senate, 1998
- Distance Education Task Force; Chair of Subcommittee on Faculty Compensation, 1998
- Selection Committee for the University Chancellor's Scholars, 1996
- Chair, Faculty Grievance Mediation Committee, 1993-1996

Graduate Education (as associate dean):

- Secretary, North Carolina Conference of Graduate Schools, 2010-2013
- Graduate School Representative: Graduate Education Taskforce; Enrollment Management Council; Residence Appeals Board; Admissions Judicial Review Committee; Academic Policies and Procedures Committee; University Research Council; Overseas Education Committee; Scholarship Advisory Council; Military Affairs Committee; Degreeworks Oversight Committee, 2005-2013
- Deputy Chair, Graduate Council, and Chair, Graduate Council Curriculum Committee, 2005-2013
- Supervisor, Graduate Recruiting, Admissions, Assistantship, and Records Staff, 2007-2013
- Advisor, Graduate Student Association Senate, 2006-2013
- Coordinator, GRAM Program, Cratis Williams Society, Alpha Epsilon Lambda Honor Society, 2005-2013
- Co-Webmaster, Graduate School, 2005-2013 (with A. Basnight)
- Developer, Online Graduate Assistant Training Materials, 2009-2013
- Presenter, Annual Meeting of the Southern Conference of Graduate Schools, February 2009, 2012, 2013