

Dr. Katie A. Evans
Program of Mathematics and Statistics
College of Engineering and Science

I thank the University Senate for considering me for the Virgil Orr Junior Faculty Award. Each day I am humbled by the brilliance and creativity of my Louisiana Tech colleagues, and it is truly an honor to even be nominated for this award.

Teaching Activities

Quarter	Course	Evaluation
Spring 2008	Math 490: Calculus of Variations and Optimal Control	In progress
Winter 2007-08	Engr 592: Computational Methods for Engineers (crosslisted with Phys 540 and Phys 470C)	3.9
Fall 2007	Math 243: Math for Engineering and Science IV	3.6
	Math 245: Math for Engineering and Science VI	3.7
	Univ 100: University Seminar	N/A
Summer 2007	Math 245: Math for Engineering and Science VI	N/A
Spring 2007	Math 245: Math for Engineering and Science VI	3.6
Winter 2006-07	Math 415: Numerical Analysis	4.0
Fall 2006	Math 243: Math for Engineering and Science IV	3.7
	Math 414: Numerical Analysis	4.0
	Univ 100: University Seminar	N/A
Spring 2006	Math 245: Math for Engineering and Science VI	3.9
Winter 2005-06	Math 244: Math for Engineering and Science V	3.5
	Math 415: Numerical Analysis	3.7
Fall 2005	Math 245: Math for Engineering and Science VI	2.4
	Math 414: Numerical Analysis	3.6

Personal Statement

Having had a passion for learning ever since grade school, perhaps it was not surprising that I fell in love with the discovery and exploration of research through participation in Research Experiences for Undergraduates. It is for this reason that I decided to pursue a graduate degree. As an undergraduate, I tutored for a variety of mathematics courses and worked as a grader and teaching assistant for developmental mathematics courses, but I never saw myself becoming a teacher. My family repeatedly told me that I would make a good teacher, but I just couldn't imagine standing before a room of students of any age and trying to teach mathematics.

However, as a Graduate Teaching Assistant, I got my chance to do just that, and I fell in love with something else – teaching. On that first day standing in front of a classroom, I discovered a part of myself that I didn't know existed, an alter ego if you will. More significantly, through this opportunity, I discovered my passion for teaching college students, and I realized that I wanted to teach at a university after completing my degree.

Prior to performing a job search, I had given much thought to the kind of institution where I wanted to be. I wanted to be able to pursue research opportunities, both my own ideas and collaborative,

interdisciplinary efforts. However, I didn't want to be at a "publish or perish" institution since research initiatives often succeed at the expense of student attention. I wanted to teach at a school with a strong commitment to quality undergraduate and graduate education, where students are not treated as disruptions or just numbers. During the interview process, Tech appeared to be just the kind of place for which I was looking, and I am even more convinced of this fact three years later.

In a time of such economic difficulty and global uncertainty, I am thankful that not only do I have a job, but also I get to make a living doing things that I love at an institution where my values and interests coincide with the University's mission. Louisiana Tech places a priority on the education and development of its students in a challenging, yet nurturing, environment that is supported by technology and interdisciplinary activities (<http://www.latech.edu/media/quick-facts.shtml>).

As an educator, one of the most important things I try to do is establish a trusting relationship with my students. If a student grows to understand that I am fair, honest, and respectful to him/her, then the student will be more likely to understand that I sincerely care about his/her success in the course. I believe that I have a friendly personality, and I try to show this in the classroom. Consequently, I think students find me approachable, and this certainly helps to establish trust and a good rapport with them. Demonstrating care and concern for my students, both in and out of the classroom, helps me to be a more effective teacher because students respond more positively to learning the mathematical content.

The subject of mathematics naturally lends itself to the development of students' critical thinking abilities and problem solving skills. This is true at all levels of mathematics, from basic algebra through graduate courses. I strive to challenge my students and make them think for themselves because I want them to be able to thrive personally and professionally in our flattened, competitive world. Even when students answer questions incorrectly, I look for shreds of good ideas in their responses because I want to encourage them to not stop trying to answer the difficult questions. We are training students to be able to tackle challenging problems of the next generation, so we owe it to society as a whole to help our students develop the capacity to think critically and creatively.

I have observed that students become more engaged in the classroom when I explain how mathematical content connects to their specific discipline. I strive to make the subject matter stimulating and relevant for my students. When I was a student, I was taught that one of the most fundamental principles in writing and public speaking is to know your audience. As a teacher, this is a principle that I carry into the classroom every day. By knowing the background and interests of my students, I am better equipped to help them learn the mathematical material in a real and personal way. If students can see mathematical connections to their own majors, they are more likely to be interested in the subject and have a more personal stake in their learning.

As appropriate, I try to mention ways in which the interdisciplinary research activities taking place at Louisiana Tech connect to topics being discussed in the classroom. This also challenges me to remain vigilant in being a lifelong learner and staying apprised of Tech's research activities, not just my own research interests. Of course, my own participation in research activities equips me with the ability to educate students on modern methods and technologies. If Tech graduates are going to compete globally, they need to be trained in state-of-the-art facilities using state-of-the-art techniques.

During my time at Tech, I have been impressed by the strong sense of community, both on and off campus. On campus, I work with an outstanding group of people who have a “we’re in it together” attitude. When something needs to be done, we chip in together and do it. At the same time, I have not been thrust into service activities prematurely. Instead, I was given the opportunity to adjust and become involved in service activities that allowed me to use my strengths to contribute most effectively to programmatic, college, and university goals. Additionally, though I’ve only lived in the area for three years, I have observed a perception from the Tech community that “Ruston is our town” and a feeling from the population that “Louisiana Tech is our university.” If it wasn’t for this partnership, I doubt that Tech could have gotten to the place it is today. It is through this symbiotic relationship that Tech has been able to expand and engage in cutting edge research while Ruston and surrounding areas have benefitted from an educated workforce and increased economic development. It is a community of which I am proud to say I am a part.

As a teacher, I continuously strive to think of better ways to explain concepts, incorporate more interesting and realistic examples, and reach more students. One of my greatest joys in life is to be in an interactive classroom where I can see students engaged and excited about their learning. The highest goal I have set for myself as an educator is to never become stagnant in my enthusiasm for teaching. I believe enthusiasm is contagious, and it is one of the best gifts I can offer my students. While teaching in the CITDL compressed video classroom this quarter, I observed a poem posted on the wall that embodied some of the ideals I hold about teaching. I have been unable to find the origins of the poem, but I did find it on the Radford University website (<http://www.radford.edu/~stuact/welcome.html>)

Because the Student...

- Because the student has a need, we have a job to do.
- Because the student has a choice, we must be the preferred choice.
- Because the student has feelings, we must be considerate.
- Because the student has an immediate need, we must be timely.
- Because the student is unique, we must be flexible.
- Because the student has high expectations, we must excel.
- Because the student has influence, our reputation is in their hands.

Because of the Student, we exist.

I was so moved by the poem, more of a mission statement really, that I put a copy on the wall just above my desk to serve as a constant reminder of why I am able to work doing the things I love.

Publications, Grants, and Similar Activities

(# denotes involvement as Principal Investigator; * denotes involvement as Co-Principal Investigator)

Funded Proposals

- (*) H-DIML: High-speed Digital Imaging and Modeling Laboratory, Louisiana Board of Regents Enhancement Program, with Mark DeCoster and Alan Chiu, June 2008 – June 2009, \$64,650.

- (#) Control Strategies of Aeroelastic-Winged Micro Munition Vehicles, Air Force Summer Faculty Fellowship Program, Summer 2008, declined due to family illness.
- (#) Travel Award to attend Society for Industrial and Applied Mathematics Control Meeting, July 2007.
- (#) Sensitivity Analysis for MinMax Control Design, Louisiana Board of Regents Research Competitiveness Program, June 2007 - June 2010, \$73,400.
- (#) Selected as a Mathematical Association of America ExxonMobil Sponsored Project NExT (New Experiences in Teaching) Fellow, 2006-2007.
- (#) WeBWorK Server, Louisiana Tech Student Technology Fee Board, with Brian Camp, Winter 2006-07, \$3500.

Unfunded Proposals

- (*) Engineering Spaces for Observation and Modeling of Brain Cell Network Activity, National Science Foundation, with Mark DeCoster, Yuri Lvov, and Alan Chiu.
- (#) i-WorK: WeBWorK in an Integrated Curriculum, National Science Foundation, with Brian Camp and Kelly Crittenden (Mark Barker, Stacy Potter, Mike Swanbom, and Galen Turner as Senior Personnel).
- (#) i-WorK: WeBWorK in an Integrated STEM Curriculum, National Science Foundation, with Brian Camp, Kelly Crittenden, Stacy King (now Potter), and Galen Turner.
- (#) Sensitivity Analysis for the Design of Low Order Controllers, National Science Foundation.

Publications

- “Reduced order compensators via balancing and central control design for a structural control problem” (with B. A. Batten), revising to resubmit.
- “Theoretical considerations of control design for the Klein-Gordon partial differential equation” (with B. A. Batten), in preparation to be submitted.
- “Riccati conditioning and sensitivity for a minmax controlled cable-mass system” (with L. Zietsman, J. T. Brown, and R. A. Idowu), submitted for review to 47th IEEE Conference on Decision and Control, to be held December 2008.
- “Sensitivity analysis for minmax parameter choice for a nonlinear cable-mass system,” submitted for review to 47th IEEE Conference on Decision and Control, to be held December 2008.

- “Reduced order controllers for distributed parameter systems: LQG balanced truncation and an adaptive approach” (with B. Batten King, N. Hovakimyan, and M. Buhl), *Mathematical and Computer Modeling*. Vol. 43, no. 9-10, 1136-1149, 2006.

University and Community Service Activities

University

- LaTechSTEP Faculty Mentor, January 2006 – Present: supported as Senior Personnel by a National Science Foundation grant for this program designed to encourage and prepare high school students to graduate in science, technology, engineering, or mathematics fields in college. I participate in Saturday workshops with high school teachers, then their students, to demonstrate math and science applications (hands-on activities, projects, etc.). The LaTechSTEP Program team won an award from the Louisiana Tech Engineering and Science Foundation Board of Directors in January 2008 for its commitment and service to undergraduate education.
- WeBWorK support and administration, Fall 2006 – Present: responsible for providing support to faculty users of this open-source, online homework delivery system, supervising student workers assigned to assist with WeBWorK implementation and support, and developing WeBWorK courses for existing mathematics courses (Math 243, 245, and 308), including the writing of homework problems as necessary.
- CAM Numerical Analysis Qualifying Exam Committee, Spring 2006 – Present: responsible for writing and grading half of the CAM Numerical Analysis Qualifying Exam twice a year.
- Math 243 Course Coordinator, Fall 2005 – Present.
- Mathematics and Statistics Program Screening and Hiring Committee, Academic Year 2006-07 and Academic Year 2007-08.
- Mathematical Contest in Modeling Team Faculty Advisor, Winter 2006-07 and Winter 2007-08.
- College of Engineering and Science Leadership Team Associate, Spring Semester 2007.
- Judge for the Louisiana Tech University “Hot ‘n’ Spicy Debates,” February 2006.

Community Involvement

First Assembly of God at North Hodge, LA: Church Choir (Fall 2007 – Present), Easter drama team (2007), Substitute Teacher for 8 and 9 year olds’ Sunday School class (Fall 2007 – Present), Vacation Bible School Teaching Assistant (Summer 2006), Fall Festival game and concession worker (Fall 2006 and 2007).