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The University of Georgia STEM Initiative II Projects, Programs and Partnerships

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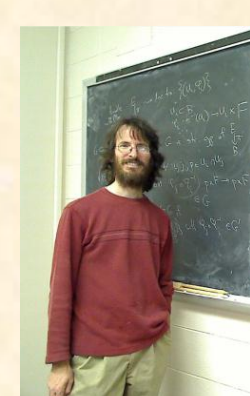
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The University of Georgia STEM Initiative II Projects, Programs and Partnerships

STEM Faculty Dedicated to Effective Instruction

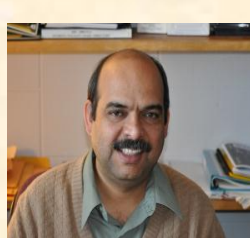
With STEM Initiative funding, **UGA hired four tenure-track faculty** dedicated to providing effective undergraduate instruction that enhances the likelihood that students will graduate with a STEM degree.



Dr. David Gay, Assistant Professor, Mathematics Department

Teaching and Service: Teaches courses for future high school teachers, graduate-level topology courses, research experiences for undergraduates, and high school outreach (MATH 5200/7200, MATH 5210/7210, MATH 8230)

Research: Geometric and differential topology; mathematics education and outreach, especially mathematics research with undergraduate and high school students



Dr. Ajay Sharma, Assistant Professor, Elementary and Social Studies Education Department

Teaching: Teaches EDMS 5460 (Student Teaching in Middle School); EDMS 5020L/5030L (Educating Young Adolescents Lab) and graduate-level courses

Research: Theoretical and ethnographic explorations of implications that climate change and neo-liberalism have for science education, the work of teachers, and the democratic agenda of schooling

Recipient of UGA Grant Award in 2011: Office of the Vice President for Research, Faculty Research Grants Program: *"Preparing for Climate Change: Exploring Nature, Society, and the Individual in Middle Grades Science and Social Studies"*



Dr. Ji Shen, Assistant Professor, Mathematics and Science Education Department

Teaching and Service: Developed a transformative modeling based unit on measurement for prospective middle school science teachers. Co-teaches CHEM 1060 to integrate content and pedagogy and infuse innovative technology into this pre-service middle school science teachers' course.

Research: Model-based teaching and learning in physical science; Modeling and visualization in technology-enhanced science education.

Recipient of NSF REESE Grant Award in 2010: To design transformative assessments to evaluate undergraduates understanding of interdisciplinary learning skills in introductory physics, biology, physiology, and science education courses.



Dr. Joachim Walther, Assistant Professor, Faculty of Engineering, Engineering Education Research

Teaching and Service: Designed and teaches a 4-course Synthesis and Design Studio sequence to introduce engineering students to the challenges of the 21st century engineering characterized by the interaction of technical, social, economic, cultural and ecological factors.

Research: The investigation of students' professional development in engineering programs and the use of interpretive research methods within the emerging field of engineering education research.

Recipient of NSF CAREER Grant Award in 2012: To develop improved methods for studying engineering education.

The Scholarship of Teaching and Learning

UGA's highly successful **Mini-Grant Program** is designed to encourage faculty to undertake innovative projects that (1) improve STEM instruction and student learning, and (2) provide contributions to the scholarship of teaching and learning.

Armstrong, Norris: ***Moving from an Instructor-Centered to a Student-Centered Class in Introductory Biology***

Foutz, Timothy: ***Analyzing Faculty Attitudes and Beliefs about a Liberal Arts-Oriented Student's Interest in the STEM Disciplines***

Kong, Fanbin: ***Development of a Video Game as a Tool to Teach "Heat Transfer" Fundamentals in Undergraduate Courses at UGA***

Lemons, Paula: ***SOLVE-IT! Tutorials: How Do Online Problem-Solving Tutorials using Faded Scaffolding Impact Student Learning?***

Mao, Leidong: ***Lab-on-a-Chip Teaching Module for Undergraduate Students at UGA***



Miller, Kristen: ***Assessing the Use of "Caselets" to Solve Teaching Dilemmas in Instructional Undergraduate Biology Laboratories that Teach Biology as Inquiry***



Shen, Ji: ***Developing a Transformative Knowledge System (TKS) for Pre-service Science Teachers***

Stanger-Hall, Kathrin: ***Online Case-Studies for Learning of Biological Processes in Introductory Biology***

Stanger-Hall, Kathrin: ***"Science-Pets" Personal Teaching Species for Learning of Biology and Environmental Literacy***

Tippins, Deborah: ***A Case Study of Pre-service Teachers' Use of Argumentation in Learning to Teach Science: The Evolutionary Basis of Global Climate Change***


Walther, Joachim: ***Reflection as a Way of Integrating Student Learning across STEM***

STEM Learning Communities

UGA's **STEM Learning Communities** are disciplinary and interdisciplinary working groups comprised of STEM faculty and (in some cases) local K-12 teachers who meet on a regular basis and work collaboratively to discuss, share, and implement ways to improve teaching and student learning.

Franklin, Chris, Statistics Department
Maddox, Kaycie, Northeast Georgia RESA
A.P. Statistics Professional Learning Community

Shifren, Ted, Mathematics Department
Whitmire, Paula, Oconee County Schools
A.P. Calculus Learning Community



The Mean of AP Calculus Student Scores of Teachers in AP Calculus LC

State of LC	School Year	AP Calc LC	State	Nation
Prior to LC	2004-05	2.00	2.80	2.94
Began 12/05	2005-06	2.63	2.85	3.02
Second Year	2006-07	3.73	2.82	2.92
Third Year	2007-08	3.36	2.70	3.01



Dustman, Wendy, Microbiology Department
Biotech Boot Camp Learning Community

White, Dorothy, Mathematics and Science Education Department
Mathematics Pedagogical Problem Solvers

Kutal, Charles, Associate Dean of A&S; Director, Office of STEM Education
Coleman, Dava, Jackson County Schools
Chemistry Learning Community

Fertig, Chad, Physics and Astronomy Department
Physics Learning Community



Brickman, Peggy, Plant Biology Department
College-Science Education Research Group

Adams, Malcolm, Mathematics Department
Blount, Sandy, Clarke County Schools
Mathematics Curriculum Team

Project FOCUS

Project FOCUS (Fostering Our Community's Understanding of Science) is a service-learning course whose goal is for STEM undergraduate students from any UGA college to bring their science knowledge into K-5 classrooms through inquiry-based lessons and, in turn, to gain an appreciation of teaching science to young students.

This year:

- 114 undergraduate students enrolled
- 8 elementary schools served



Regional STEM Institute of Teaching and Learning

The Office of STEM Education
will host
The 2012 Regional STEM Institute on Teaching and Learning
Saturday, April 14, 2012
8:00 am to 4:30 pm
Classic Center, Athens, Georgia

- Panels will discuss the importance of STEM education reform at the national, state, and local levels, as well as leveraging the NSF Broader-Impacts Criterion
- STEM faculty will share teaching approaches for large undergraduate courses that actively engage students
- Mini-grant recipients will discuss contributions to the Scholarship of Teaching and Learning

Contact Information

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