2011 ASEE
Midwest Section
46th Annual Conference

Educating Engineers for Today and the Future

September 28-30, 2011

ARKANSAS TECH UNIVERSITY

2011 ASEE Midwest Section Annual Conference

Welcome to the 2011 ASEE Midwest Section Conference. This conference is the annual technical forum and business meeting of our section. It provides an important venue to support and encourage education innovation and excellence in our engineering programs. You will find many opportunities to increase your knowledge and network. We thank the conference committees, authors, reviewers, and other contributors for their efforts.

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Midwest Section Chair, Tennessee Technological University
Theresa Swift
Midwest Section Chair-Elect
Missouri University of Science and Technology
Christi Patton-Luks
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Conference Schedule

Wednesday, September 28, 2011

6:00-8:00 p.m. Welcoming Reception
Hickory Lodge Atrium

Thursday, September 29, 2011

7:30 - 10:30 a.m. Registration Desk Open
Event Center Exhibit Hall

8:30 - 9:00 a.m. Welcoming Remarks by Dr. John Watson
Vice President for Academic Affairs
Event Center, Room C

9:00 - 10:20 a.m. Paper Session 1
Event Center, Room C
Session Moderator: Tom Roberts

9:00 a.m. *Service Learning in Engineering*
Lawrence Whitman - Wichita State University
Karen Reynolds, Zulma Toro-Ramos - Wichita State University

9:20 a.m. *Direct Versus Indirect Assessment Methodologies*
Steve Menhart - University of Arkansas at Little Rock

9:40 a.m. *Adapting Team-Based Learning to Early Engineering Courses*
Robert O'Connell - University of Missouri

10:00 a.m. *Engineering Outreach: A Summer Program Approach*
Eric Specking - University of Arkansas
Edgar Clausen - University of Arkansas

9:00 - 10:20 a.m. Paper Session 2
Guest House, Room B
Session Moderator: Steve Watkins

9:00 a.m. *Use of Computer Simulation Games for Instructional and Recruiting Purposes in Middle School and Jr. High Research Experiences for Teachers (RET) 2010*
Ed Pohl - University of Arkansas
Melissa Miller - Lynch Middle School
Randall Reynolds - Gravette Jr. High School

9:20 a.m. *Ansanm: A Cross-Cultural, Interdisciplinary Approach to Learning Human-Centered Design*
James Huff - Harding University
Todd Patten, Richard Wells, Monte Cox - Harding University

9:40 a.m. *Evaluating Retention of Engineering Problem Solving Skills of First-Year Engineering Students*
Kellie Schneider - University of Arkansas
Heath Schluterman, C. Richard Cassady
University of Arkansas

10:00 a.m. *An Analysis of Online Master's Programs in Engineering*
Michael Reynolds - University of Arkansas-Fort Smith
Nick Huisman - University of Arkansas-Fort Smith

10:20 - 10:45 a.m. Break

10:45 - 11:45 a.m. Paper Session 3
Event Center, Room C
Session Moderator: Dennis Schulte

10:45 a.m. *Laptop Recycling Project: A Service-Learning Experience*
Patricia Buford, Arkansas Tech University

11:05 a.m. *A Detailed Process for Creating Multiple Choice Exams in a Mechanics of Materials Course*
Jeffrey Thomas - Missouri University of Science and Technology
Malcolm Hays, Megan Meyer
Missouri University of Science and Technology

11:25 a.m. *Transforming a Microprocessors Course through the Progressive Learning Platform*
Sohum Sohoni - Oklahoma State University
David Fritz, Wira Mulia - Oklahoma State University

10:45 - 11:45 a.m. Paper Session 4
Guest House, Room B
Session Moderator: Theresa Swift

10:45 a.m. *Work-in-Progress: Enhancing Students' Interest, Motivation and Academic Abilities using Video Games*
Jullius Marpaung - Oklahoma State University
Louis Johnson, William Flanery - Oklahoma State University

11:05 a.m. *A Simple Approach to the Introduction and Assessment of Lifelong Learning in a Freshman-Level Technology Course*
Julia Morse - Kansas State University Salina

11:25 a.m. *Incorporating 3D RP Process in Biomedical Engineering Design*
Shankar Krishnan - Wentworth Institute of Technology
Timothy Roemer, Pawel Kosakowski, Jonathan Cefalu
Wentworth Institute of Technology

12:00 - 1:00 p.m.	***Lunch*** ***Event Center Dining Room***
1:15 - 2:15 p.m.	*Plenary Session* *Ian Baring-Gould* *NREL, Golden, Colorado*
2:30 - 5:30 p.m.	*Arkansas Nuclear One tour* *Museum of Automobiles tour* *NSF Noyce Program Grant Writing Workshop*
6:00 - 6:45 p.m.	*Banquet Reception* *River Room*
6:45 - 8:30 p.m.	*Banquet* *Event Center Dining Room*
8:30 - 9:00 p.m.	*Executive Committee* *Board Room*

Friday, September 30, 2011

7:30 - 8:00 a.m.	*Campus Representatives Meeting* *Guest House, Room B*
8:00 - 9:00 a.m.	***Paper Session 5*** ***Event Center, Room C*** ***Session Moderator: Francis Thomas***
8:00 a.m.	*An Interpretation of the Bode Plot in the Time Domain* *Monty Smith - Arkansas Tech University* *Lakshmi Sudhaker - Arkansas Tech University*

ARKANSAS TECH
A CENTURY FORWARD

8:20 a.m. *Bernoulli Balance Experiments Using a Venturi*
Edgar Clausen - University of Arkansas
Roy Penney, Megan Dunn - University of Arkansas

8:40 a.m. *Women Recruitment/Retention in STEM Fields*
Rebeca Book - Pittsburg State University

8:00 - 9:00 a.m. **Paper Session 6**
Guest House, Room B
Session Moderator: Terry Martin

8:00 a.m. *Project-based Learning: Centrifugal Pump Operations*
Tom Marrero - University of Missouri

8:20 a.m. *Including Distance Technology in the Regular Classroom*
Doug Carroll - Missouri University of Science and Technology

8:40 a.m. *A Three-Semester Capstone Design Experience: Advantages and Disadvantages*
Kenneth Fischer - University of Kansas
Christopher Depcik, Lorin Maletsky, Robert Sorem, Ronald Dougherty - University of Kansas

9:00 - 9:20 a.m. **Break**

9:20 - 10:40 a.m. **Paper Session 7**
Event Center, Room C
Session Moderator: Raju Dandu

9:20 a.m. *The Machine Component Design Manual Project and Other Tools for Teaching Mechanical Design*
James Steuber - Arkansas Tech University

9:40 a.m. *Mechanics of Materials, Machine Design, and Vibrations Finite Element Learning Modules for Undergraduate Courses (*Invited*)*
Marwan Abumahaimed - University of Arkansas
Joseph J. Rencis - Tennessee Technological University

10:00 a.m. *Manufacturing Engineering Curriculum Renewal in a General BSE Program*
David Che - Geneva College
David Clark, Tom Magnone - Geneva College

10:20 a.m. *Environmental Impacts of Nanotechnology and Its Products*
Bangwei Zhang, Wichita State University
Ramazan Asmatulu, P.S. Dhanasekaran, Heath Misak
Wichita State University
Devi Kala - Metropolitan State College of Denver

9:20 - 10:40 a.m. **Paper Session 8**
Guest House, Room B
Session Moderator: Jim Lookadoo

9:20 a.m. *Another Look at the Freshman Engineering Course*
Robert Egbert - Missouri State University

9:40 a.m. *An Evaluation of Some Low-Cost Rapid Prototyping Systems for Educational Use*
Wayne Helmer - Arkansas Tech University
Damon Mobbs - Arkansas Tech University

10:00 a.m. *Experiments on Experiments, Determining Uncertainty for Complex Experiments using Matlab*
Robert Fithen - Arkansas Tech University

10:20 a.m. *Using Open Source Software to Prepare Students for Senior Design*
Robert Fithen - Arkansas Tech University

11:00 - 11:30 a.m. Session Chairs Meeting
Guest House, Board Room

Department Heads Session
Guest House, Room B

11:30 - 12:30 p.m. ASEE Membership Forum
Event Center, Room C

12:30 - 2:00 p.m. **Lunch**
Event Center Dining Room

Membership Meeting
Awards Presentation

Lake Point CONFERENCE CENTER *at Arkansas Tech University*

ARKANSAS TECH UNIVERSITY

Founded in 1909, **Arkansas Tech University** is rich in history and is now one of the fastest growing universities in the state. Tech provides a campus small enough for individual attention, yet large enough for a quality education.

Our Mission: Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. Tech offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Arkansas Tech University, located in **Russellville, Arkansas** is situated in the heart of the Arkansas River Valley Tri-Peaks region. Nestled between the beautiful Ozark and Ouachita Mountains as well as Lake Dardanelle State Park, Russellville offers small town appeal with city benefits. With a population of almost 25,000, Russellville is only an hour from the capital city.

The **College of Applied Sciences** encompasses the Departments of Agriculture, Computer & Information Science, Electrical Engineering, Emergency Management, Mechanical Engineering and Parks, Recreation & Hospitality Administration.

The **Department of Electrical Engineering** is home to six faculty and 170 undergraduate students. The department offers two versions of the BSEE degree, the traditional electrical engineering path or the computer engineering option. The department also offers a concentration in Electrical Engineering for students pursuing the Masters of Engineering degree at Arkansas Tech.

The **Department of Mechanical Engineering** is home to seven faculty and 274 undergraduate students. The department offers degrees at three levels, the Associate of Science in Nuclear Technology, the BSME, and concentrations in Mechanical Engineering and Nuclear Engineering as part of the Masters of Engineering degree program.

The **American Society for Engineering Education** (ASEE) has provided leadership and information to the U.S. engineering education community since 1893. Through several key policy studies of engineering education, provocative and informative publications, and opportunities for interaction among its members, ASEE has helped the community adapt to society's changing needs to ensure the continued relevance of engineering education.