M637 – PEDAGOGICAL INNOVATIONS IN LABORATORY EDUCATION

Machine Design Lab: Using Automotive Transmission Examples to Reinforce Understanding of Gear Train Analysis
Roger A. Beardsley, Charles O. Pringle

Modeling and Experimental Verification of PLC Codes in a Robotics and Mechatronics Course
Richard Chiang, Yongjin Kwon, Robin Katrinn, Matthew Doroski, Bret Alan Davis

A Relevant, Automotive-Themed Experiment that Teaches Fundamental Flow Rate Concepts and Experimental Uncertainty
Brian P. Sangeorzan, Matthew Nathaniel Bruer, Laila Guessous, Xia Wang

Innovative Shake Table Laboratory Instruction: Implementation and Assessment of Student Learning
Alyssa Marie Turner, Sandra Shaw Courter, Shirley Dyka

Teaching Flownet Concepts to Engineering Undergraduates Using Electrical Analogy of Groundwater Flow
Murphy Kur, Tapitina Chi, G. Padmanabhan

M638 – FPD IV: IMPROVING STUDENT SUCCESS: MENTORING, INTERVENING, AND SUPPLEMENTING

Engineering Student Success: An Intervention Course
Dianna R. Kuchinkeimer, Jerome P. Lavelle, Monica Terrell Leach, Steven L. White, Philip Albert Moses

Residential Peer Mentoring Benefits Mentees: What about Mentors?
Elora Candace Wray, Khanda K. Koneah, John W. Nicklow, Robert Ricks

Opening the Engineering Gateway: Can Differentiated Instruction Help Prepare Our Underserved Students?
Craig J. Scott, Yanob-Astrotza, Jameka Kami Ladeji-Crisis, Carl White, Myra W. Curtis

Peer-led Supplemental Instruction in an NSF STEP Project: The EEES Experience
Colleen A. McDonough, Daina Briedis, Norej B. Buch, R. S. Degraaf, Jon Sticklen, Sarah J. Stoner, Mark Urban-Lurain, Claudia E. Vergara, Thomas F. Wolf

First year engineering students are strikingly impoverished in their self-concept as professional engineers
Frederick L. Smyth, William H Guiford, Brian A. Nosek

M639 – PANEL ON INNOVATIVE GRADUATE CONCEPTS: ORGANIZED BY THE NATIONAL INSTITUTE OF AEROSPACE

Project-Based Residency Course for Online Graduate Program
Bimal P. Nepal, F. Barry Lawrence

Overcoming the Challenges of Distance Education Delivery of a Master of Science Degree in Construction Management
Amy E. Lardis, Melissa M. Bline, Leidy Kist, Annie R. Pearce

Lessons Learned from a Distance Learning Research Methods Course Co-Taught by Clemson, University of Pittsburgh, and Virginia Tech
Mark Shuette, Joe Overby

M641 – INNOVATIONS IN COMPUTING EDUCATION

Exploring the Use of Virtual Machines and Virtual Clusters for High Performance Computing Education
Thomas J. Hacker

Integration of Mobile Technology into Undergraduate Engineering Curriculum
Tao Xing, Legond L. Burge Jr, Hashem A. Aglan
Implementing an Affordable High Performance Computing Platform for Teaching-Oriented Computer Science Curriculum

Jeongkyu Lee, Omar Abuzghleh

Students' Understanding of Computational Problem-Solving Tasks


M645 – A GLOBAL ENGINEER: INTERNATIONAL AND DOMESTIC ENGINEER

Attributes of a Global Engineer

Stephen Hundley, Lynn G. Brown, Alan Jacobs, Patricia Fox, Catherine Didion, Daniel R. Sayre, Hans J. Hoyer

Comparison of Preferred Learning Styles for International and Domestic Undergraduate Engineering Students

Issac W. Wall, Andrew P. Nicholls, Wael A. Zatar

Using Spiral Dynamics to Prepare Engineers for the Global Workforce

Claudio Da Rocha Brito

The Discussions after the Bologna Process in Europe: The Global Engineer

Charles Paveuhl

M644A – THINKING OUTSIDE THE BOX! INNOVATIVE CURRICULUM EXCHANGE FOR K12 ENGINEERING

Novel Curriculum Exchange: Research-based teacher professional development strategies to support Elementary STEM curriculum

John C. Beahward, Eric N. Wihe, Lauren Madden

Designing and Testing Water Filtration Devices using the Engineering Design Process: A Description of an Eighth Grade Curriculum Unit on Bioremediation

Tirupalaesam G. Ganesh, Lisa Stemple Rendall, Johnny Thieken

Exchange: Multi-Day Earthquake Engineering Workshop for Middle School Students

Benjamin V. Fell

Curricular Exchange between a STEM University and a Rural Elementary School: The Establishment of an Interactive Video Link

Van Stephen Blackwood, Barbara M. Mokkal

Exchange: Using Squishy Circuit Technology in the Classroom

Samuel Abas Johnson, Anorraine Thomas

Exchange: GeoFex/MATE Science Learning Modules

James C. O'Brien, Rebecca A. Stein, Garrett M. Clayton, Aaron P. Wemhoff, C. Nataraj

Exchange: Engineering is Elementary Lessons that Highlight Sustainability

Sharlene Yang, Christine M. Cunningham

Engineering with Electricity and Magnetism: A Guided-Inquiry Exercise for High-School Students to Enhance Understanding of Faraday's and Lenz's Laws

Micheal Sziklai, Bruce Kost


Nancy Healy, Joyce Palmer Allen

The United States Air Force Academy Department of Aeronautics Glider Design Workshop

Cassie R. Turel, Neil Barlow, Kristine M. Bryant

Curriculum Exchange: Educational Aspects of Computational Modeling and Kinesthetic Experimentation

Blake C. Wade, Yvette Pearson Weatherford, Melanie L. Saltier

Engineering in Healthcare: A Heart Lung System

Zachary Van Der Haar, Taryn Melkus Bayles, Julia M. Ross

Ob, GI High School Students Discover Gravitational Acceleration Using Ubiquitous Technology

Michael K. Swenson, David E. Hull, Heath Tims

Using Digital Images to Teach Abstract Math and Inspire Students towards Careers in Computer Science and Engineering

Victor Mejia, Jessica Aharenga, Jianyu Dong, Huiping Guo, Israel Hernandez, Eun-Young Kang, Phanit Pollavilh, Adriana Trejo, Nancy Warner-Perez

Exchange: Experiential Earthquake Engineering Education for High School Students through the California State Summer School for Mathematics and Science

Laeli Van Den Brinde, Samuel Lee

Using Web Apps to Stimulate Learning

Joseph J. Biernacki, Donald P. Visco, Evangelyn Thurber, Ryan Thomas Pavlovsky

M649A – MECHANICAL ENGINEERING LABORATORIES I

Assessing and Updating an Undergraduate Thermo-Fluids Laboratory Course

Gregory J. Michno, Stephen Gent
A Dimensional Analysis Experiment for the Fluid Mechanics Classroom
Charles Forsberg

Integrated Hands-On Mechanical Systems Laboratories
Arif Sirinterlikci, Tony Lee Kersmann

Five Forced-Vibration Laboratory Experiments using Two Lumped Mass Apparatuses with Research Caliber Accelerometers and Analyzer
Richard J. Ruhala

M649B - WHY INDUSTRY SAYS THAT OUR ENGINEERING STUDENTS CANNOT WRITE

A Writing Program for Mechanical Engineering
William K. Durfee, Benjamin Adams, Audrey J. Appelsies, Pamela Flash

Overcoming the Challenges of Implementing Technical Communication in a Capstone Senior Design Course
G. Scott Duncan, Mark M. Rudolph, Jeffrey Will, Peter E. Johnson, Shahin S. Nudehi

Why Industry Says That Engineering Graduates Have Poor Communication Skills: What the Literature Says
Jeffrey A. Donnell, Betsy M. Aller, Michael Alley, April A. Kedrowicz

Revisiting Communication Experiences to Prepare for Professional Practice
Kathryn Mobrand, Jennifer A. Turner

Preliminary Analysis of Student and Workplace Writing in Civil Engineering
Susan Conrad, Timothy J. Pfeiffer

M651 - INNOVATIVE METHODS TO TEACH ENGINEERING TO OURMS

Effectiveness of Team-Based STEM Project Learning to Recruit Minority High School Students to STEM
Jean Kampe, Douglas E. Oppliger

Using Robotics for Teaching Critical Thinking, Problems Solving, and Self-Regulated Learning for Freshmen Engineering Students
Gordon W. Skalinos, Qing Pang, Wei Zheng, Huiru Shih

Influences of S-STEM Funding: Final Outcomes of Four Year Scientific Leadership Scholars Program Including Improvements to Department Retention Practices
Elizabeth A. Eschenbach, Mary E. Virnoche, Tyler J. Evans

INSTRUCT: Integrating NASA Science, Technology, and Research in Undergraduate Curriculum and Training
Ram V. Mohan, Ajit D. Kelkar, Keith A. Schimmel, Vinaya Kelkar

Enhancing the Future of America's Competitiveness through Entrepreneurial Engineering
Carolyn A. Vallia, Wraegen A. M. Williams

High Power Rocketry Program: Undergraduate Research Experience for an HBCU
Showkat Chowdhury, Mohamed A. Seif

M652 - MULTIDISCIPLINARY TECHNICAL SESSION

The Montana MULE: A Case Study in Interdisciplinary Capstone Design
Brock J. Lameres, Ahsan Mian, Hunter Lloyd, Robb Larson

Using the EcoCAR Challenge as a Non-Traditional Domain for Software and Computer Engineering Capstone Course
Ruth E. Anderson, Beth Kalka

Designing Technology for Resource-Constrained Environments: A Multidisciplinary Capstone Sequence
Ruth E. Anderson, Beth Kalka