American Society for Engineering Education

2007 Illinois/Indiana Section Conference

March 30-31, 2007

Hosted by

Brickyard Crossing
Indianapolis Motor Speedway
Indianapolis, Indiana

Conference Program Sponsored By:

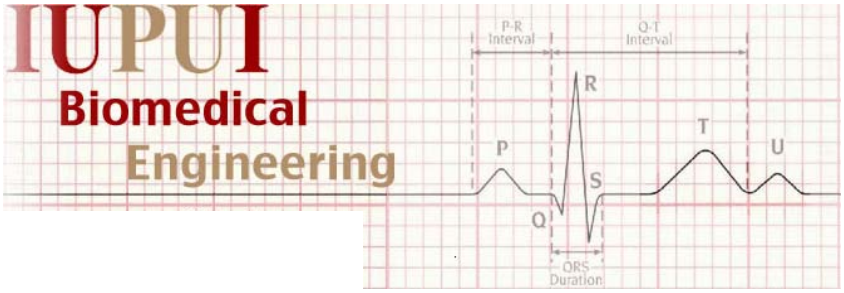
Welcome

The Purdue School of Engineering & Technology at IUPUI wants to welcome all of you to Indianapolis for the 2007 ASEE Illinois/Indiana Section conference. We are excited by the quality of research that you will see this weekend. We have over 60 presentations by faculty from over two dozen different colleges and universities. We are pleased to have sessions in two subject areas that are near and dear to our hearts at IUPUI, as well as being two of the fastest growing areas in STEM Education: Biomedical Engineering and Motorsports Technology. Other sessions cover the full range of topics pertinent to today's Engineering & Technology educators. We are also thrilled to have 39 student posters representing 11 different schools. Additionally, we have excellent lunch and dinner speakers, both of whom have had leadership roles within ASEE, Dr. James Melsa and Dr. Gerald Jakubowski.

We are proud to host this event at one of America's premier sports facilities, the Indianapolis Motor Speedway, home to the Indianapolis 500, the United States Grand Prix, and the NASCAR Allstate Brickyard 400. We hope that you take advantage of your time before or after the conference to tour the museum and speedway.

If we can do anything to make your stay more pleasant, please be sure to let us know.

Pete Hylton & Pat Fox
Conference Co-Chairs



Conference Schedule

Friday, March 30

Registration Open 10:00 am – 5:00 pm
Tours Available
Indianapolis Motor Speedway Museum (open until 5:00 pm)
Track Tours (available through Museum, until 4:00 pm)
Technical Sessions 11:45 pm – 1:15 pm
Session 1A – Auburn Room – Digital Signal Processing & Programming
Session 1B – Stutz Room – Engineering Processes and Applications
Session 1C – Duesenberg Room – Automotive & Aerospace Technology
Break 1:15 pm – 1:30 pm
Technical Sessions 1:30 pm – 3:00 pm
Session 2B – Stutz Room – Statics & Strength of Materials
Session 2C – Duesenberg Room – Trends in Learning I
Last chance to visit Indianapolis Motor Speedway Museum 3:00 pm – 5:00 pm
IL/IN Section Business Meeting - Auburn Room - 3:00 pm – 5:00 pm
Welcome Reception (Hors D'Oeuvres & cash bar) – Parlours A-D 5:30 pm – 7:00 pm

Saturday, March 31

Registration Open 8:00 am – 9:00 am
Continental Breakfast 8:30 am – 9:00 am
Technical Sessions 9:00 am – 10:30 am
Session 3A – Auburn Room – Motorsports Education
Session 3B – Stutz Room – Clinical & Biomedical Processes
Student Poster Judging – Duesenberg Room & Hallways
Student Poster Session – Duesenberg Room & Hallways 10:30 am- 11:30 am
Lunch - Parlours A-D - 11:30 am – 1:00 pm
Sponsored by Purdue University
Keynote Speaker: Dr. James Melsa, ASEE President Elect & Dean Emeritus at Iowa State University
Year of Dialog Discussion - 1:00-2:00 - Facilitated by J.P. Mohsen & James Melsa,
Technical Sessions 2:00 pm – 3:30 pm
Session 4A – Auburn Room – Approaches for Success
Session 4B – Stutz Room – Biomedical Engineering
Session 4C – Duesenberg Room – Trends in Learning II
Break 3:30 pm – 3:45 pm
Technical Sessions 3:45 pm – 5:15 pm
Session 5A – Auburn Room – Hands-On Education
Session 5B – Stutz Room – Future Directions
Session 5C – Duesenberg Room – Automation & Power
Dinner & Awards (w/ cash bar) – Parlours A-D 5:30 pm – 7:00 pm
Sponsored by Rolls-Royce Corporation
Dinner Speaker: Dr. Gerald Jakubowski, Past president of ASEE, Chairman of ABET-EAC, and President of Rose-Hulman Institute of Tech.

Awards to be Presented:
Outstanding Teaching Award
Outstanding Paper Award
Outstanding Service Award
Outstanding Student Poster Award
Honorable Mention for Student Posters

ASEE Illinois/Indiana Section Conference

Annual Awards Banquet Sponsor

Rolls-Royce

Join us at the Saturday night awards banquet to recognize the Outstanding Conference Paper, Outstanding Student Posters, and Outstanding Educators in the IL/IN Section

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Luncheon Sponsor

PURDUE UNIVERSITY

Join us afterward for a discussion on the ASEE Year of Dialog

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Conference Program Sponsored By:

BSA LifeStructures™

Technical Sessions

We are extremely pleased and excited to have over 60 presentations on a variety of Engineering and Technology topics. Please enjoy the conference, network with your colleagues, and take advantage of the materials presented here this weekend.

Rich Pfile
Program Chairman

Friday, March 30

Session 1A Digital Signal Processing & Programming

Paper 13: Teaching DSP First with Labview
Mark A. Yoder, Bruce Black
Rose-Hulman Institute of Technology

Paper 35: Circuit Approach to Skin Effect
James H. Spreen
Indiana Institute of Technology

Paper 102: Using the Java Native Interface to Introduce Device Driver Basics
James Brown
IUPUI

Paper 63: Autonomic Computing Systems: Towards a Self-Healing OS
Sharee S. Laster, Ayodeji Olatunji
Jackson State University

Session 1B Engineering Processes and Applications

Paper 66: Using Finite Element Software Post Processing Graphics Capabilities to Enhance Interpretation of Finite Element Analyses Results
Cyrus K. Hagigat
University of Toledo

Paper 75: Ergonomic Design of Manual Assembly Workplaces
V. Jovanovic, M. Tomovi, I. Cosic, G. Ostojic, Dositeja Obradovica
Purdue University

Paper 88: Engaging Constituents in an Academic Search Process
Antonio Bobet, Phillip Dunston, Aaron Evans, Jon Fricker, R. Govindaraju, Linda Higgins, Steve Johnson, Michael Kreger, Larry Nies, Jan Olek, Perry Pinto, Monica Prezzi
Purdue University

Paper 90: Teaching Systems Engineering by Examining Engineering Education Systems
Barrett S. Caldwell
Purdue University

Paper 94: An Industrial Project Management Course for Technology Curriculum
Bimal P. Nepal, Jihad M. Albayyari
Indiana University Purdue University Ft.Wayne

Paper 72: The Overlap Between Mechanical and Civil Engineering Graduate Education
Aiman S. Kuzmar, Iyad Muslih, David B. Meredith
Penn State Fayette

Paper 41: Porous Concrete Pavement Construction: Opportunity for Alternative Drainage Methodology Emphasis in Construction Education
Erdogan Sener
IUPUI

Session 1C Automotive & Aerospace Technology

Paper 87: Purdue University DURI Program Research on Two-Phase Fuel Separation in a PEM Fuel Cell
Elizabeth Peruski, Shuichiro Miwa, Shripad T. Revankar
Purdue University

Paper 96: An Interdisciplinary Student Design Project Involving Electrical and Mechanical Engineering
Jon Marstrander, Tina Oliver
University of Alabama Birmingham

Paper 46: A University-Industry Collaborative Project in the Development, Evaluation, and Implementation of an Aircraft Assembly Animation
Craig Miller, Nicoletta Adamo-Villani, Dan Wittenborn
Purdue University

Session 2B Statics & Strength of Materials

Paper 28: Physics as a Prerequisite for Statics
David P. Devine
Purdue University

Paper 33: Meteorites and Materials in a ME Lab Course
A. Bernal, C. Edds, B. Hathaway, N. Miller, H. McLean, R.A. Layton, D.S. Fischer, P.D. Ferro
Rose-Hulman Institute of Technology

Paper 38: Methodology for Correlation of Charpy and Tensile Test Results for Energy Absorbed During Failure
D. DeVirgilio, J. Hammer, P.D. Ferro
Rose-Hulman Institute of Technology

Paper 74: Engineering Analysis in the MET Engineering Dynamics Course
Zhongming (Wilson) Liang
Indiana University Purdue University Fort Wayne

Paper 101: Solution Treatment of Aluminum Alloys in Aerodynamic Heating Furnaces
Alexy Sverdlin, Arnold Ness
Bradley University

Session 2C Trends in Learning

Paper 1: Guidelines for Assessment and Evaluation of Engineering and Technology Programs
S. Balachandran, Univ. of Wisconsin – Platteville
L. Balachandran, Div. of Transportation System Development – Southwest Region, Wisconsin

Paper 100: Assessing the Usability of Web-based Multimedia Instruction and Virtual Reality-based Laboratory Practice
Hazim El-Mounayri, Eugenia Fernandez, Julie Bohnenkamp
IUPUI

Paper 17: Applying Research-Based Instructional Methods in the Classroom
Jim Houdeshell
Sinclair Community College

Paper 92: Justification for Developing a Masters of Science in Technology at Indiana University-Purdue University Fort Wayne
Hal Broberg, Jihad Albayyari, B . Nepal
Indiana University-Purdue University Fort Wayne

Paper 95: Multiple Experiences in Moving from a Traditional Classroom Setting to an On-Line Teaching Environment
Pete Hylton, Wendy Otoupal
IUPUI

Paper 67: Self-Sustaining and Culturally Adaptive STEM Training Tool
Peter J. Schubert
Packer Engineering, Inc.

Session 3A Motorsports Education

Paper 3: Let's Go Racing – Constructing a Collegiate Motorsports Program
Pete Hylton
IUPUI

Paper 8: Motorsports Studies at Indiana State University
Randell Peters
Indiana State University

Paper 15: Karting Engineering Educational Opportunities in Illinois and Indiana
Joe G. Harper, University of Illinois
Matthew G. Harper, Mahomet-Seymour High School

Paper 20: Motorsports Internships
Terri Talbert-Hatch, Josh Killey, Mark Ambrester
IUPUI

Paper 45: Using Product Lifecycle Management (PLM) Theories and Applications in the Design, Test, and Build, of a Racing Go-Kart
Craig Miller, Nicoletta Adamo-Villano
Purdue University

Paper 62: Shop Rat.Org, A Grassroots Movement Empowering Tomorrows Engineers and Techies
Doug Acheson, IUPUI
Chris Salow, Shop Rat Associates

Session 3B Clinical & Biomedical Processes

Paper 10: Engineering and Health Care: Higher Education Status Report
Barbara Christe
IUPUI

Paper 12: Improving Processes Throughput of Cardiac Catheterization Using Six Sigma Training
Daphene Cyr Koch, Purdue University
Heather Woodward, IUPUI
Diane Brown, Kenney Montgomery, Mark Manning, Sisters of St. Francis Healthcare Services

Paper 32: Engineering and Technology in the Allied Health Sciences: Sources for Research and Teaching
Nestor L. Osorio, Jitka Hurych
Northern Illinois University

Paper 59: "All Bundled Out" – Application of Lean Six Sigma Techniques to Reduce Workload Impact during Implementation of Intensive Glucose Control within Critical Care – A Case Study
Heather Woodward, IUPUI
Jamie El-Harit, Chris Vanni, Sisters of St. Francis Healthcare Services

Paper 60: Application of Lean Six Sigma Techniques to Optimize Hospital Laboratory Emergency Department Report Time Across a Multi-Hospital System
Heather Woodward, IUPUI
Susan Scachitt, Lash Mapa, Purdue University Calumet
Chris Vanni, Lillie Brandford, Sisters of St. Francis Healthcare Services

Session 4A Approaches for Success

Paper 4: A Joint Approach to Recruiting: Purdue and Ivy Tech Team Up to Reach Local High School Students
Gene Harding, Purdue University
David Brinkruff, Ivy Tech Community College

Paper 11: Improving Retention and Satisfaction by Connecting to Students
Barbara Christe, Kenneth Reid
IUPUI

Paper 21: The Freshman Year in Engineering
Robert Chasnov
Cedarville University

Paper 30: Fostering Collaborative and Diversity by Hosting a Joint ASEE Section Conference
G. D. Steffen, H.I. Abu-Mulaweh
Indiana University-Purdue University Fort Wayne

Paper 49: A Professional Practice Primer at Tri-State University
David Finley
Tri-State University

Paper 99: Deployment of On-Line Tests to Maximize Learning
Ronald Garrett
Grand Valley State University

Session 4B Biomedical Engineering

Paper 7: Integrating the Traditionally Trained Mechanical Engineer (Problem-Solver) into Modern Medical Research Projects
George M. Malcinski, Hiroki Yokota, Hasan Akay
IUPUI

Paper 14: Video Image Based Multimodal Face Recognition System
Craig Belcher, Matt Terry, Sophie Vinci-Booher, Eliaz Du
IUPUI

Paper 44: Integrating Research and Engineering Education: A Case Study of Undergraduate Research in Orthopaedics
Mary Phillips, Megan Schroeder
University of Notre Dame

Paper 48: Introduction of a Novel Biomedical Engineering Concentration into an Interdisciplinary Engineering Program and Lessons Learned
Loutfallah Georges Chedid, Salah Badjour
Wentworth Institute of Technology

Paper 50: Dynamic Tumor Motor Simulation for Radiation Treatment of Cancer Patients
Harikrishna K. Rajabather, Huanmei Wu,
IUPUI

Paper 56: Analysis and Correlation of Internal Tumor and External Mark Motion for IGRT
Huanmei Wu, Malkia Mahoui, Mary McLaughlin
IUPUI

Session 4C Trends in Learning II

Paper 70: A One-Credit First Year Introduction to Engineering Seminar Course at Penn State Fayette Helps Freshman Students in Choosing an Appropriate Engineering Major: a Student's Perspective
Patrick Johnson, Aiman S. Kuzmar
Penn State Fayette

Paper 76: New Integrated Materials and Manufacturing Course Sequence for Mechanical Engineering Technology
Tim Cooley, Purdue University New Albany
Rodney Handy, Purdue University West Lafayette
Sarah Leach, Purdue University South Bend

Paper 85: Taking a Step Forward in Lean Thinking: A Product Lifecycle Management Course
Patricio Torres, Mileta Tomovic
Purdue University

Paper 97: Comparing Student Performance and Perceptions in Face-to-Face, Distance Education and Blended Course Delivery Environments
Jim Houdeshell, Susan Chuddle
Sinclair Community College

Paper 31: A Comparison of Learning Styles in an Introductory Electrical Systems Course
Carlotta Berry, Deborah Walter
Rose-Hulman Institute of Technology

Session 5A Hands-On Education

Paper 71: An Analysis of the Ways in Which Universities Treat Physical Education Courses in Their Engineering Curricula
Abedalbasit Abedalhafiz, The Hashemite University,
Aiman Kuzmar, Penn State Fayette

Paper 98: Mining/Mineral Engineering Education on the Job: A New Concept
Manoj Mohanty, Yoginder Chugh, Satya Harpalani
Southern Illinois University Carbondale

Paper 89: Hands-On Education Outreach: Purdue Fall Space Day
Ann Broughton, Cindy Mahler, Barrett Caldwell
Purdue University

Paper 9: Experience with Active Learning, Frequent Assessment and Student Evaluations
Joe Fuehne
Purdue University Columbus

Session 5B Future Directions

Paper 23: Current and Future Trends in Engineering and Technology Programs
Harvey I. Lyons
Eastern Michigan University

Paper 34: Educational Globalization: the European Credit Transfer System
Glenn R. Blackwell
Purdue University

Paper 47: Investigating Diversity: A Study of One Institution's Main and Extended Campus Undergraduate Engineering Programs
Kenneth Royal, Gera Drake, G.T. Lineberry, William Murphy
University of Kentucky

Paper 36: Importance of Teaching Ethics
Thomas Dobrowski
Purdue University North Central

Paper 69: A Comparative Analysis on Students' Attitudes and Perceptions Towards Academic Dishonesty Between Students in China and in the United States
Haitao Zhou, Normal University,
Shi Lan, DeVry University

Paper 91: Dual-Level Accreditation of Engineering Programs
M.R. Wilhelm, J.P. Mohsen
University of Louisville

Session 5C Automation and Power

Paper 16: New Industrial Automation Laboratory & Courses, ECET Technology Program Improvement
Gale Allen
Minnesota State University Mankato

Paper 22: A µC Controlled Power Factor Corrected AC-to-DC Boost Converter with DCM Operations
M.M.A. Rahman, Brad Boersma, Bryan Schierbeek
Grand Rapids State University

Paper 24: Using PLC Projects to Aid Teaching of Advanced Electrical Control Principles
William Ted Evans
University of Toledo

Paper 26: A Capstone Experience in Manufacturing Automation Through Integration of Robotics, Machine Vision and Programmable Controllers
Andrew Otieno, Daniel Nikolov, Richard Velasco
Northern Illinois University

Student Posters

We are extremely pleased and excited to present 39 student posters on a variety of Engineering and Technology research topics. Please take the opportunity during our Saturday morning Student Poster Session to view all of these projects. No paper sessions have been scheduled during this period in order to permit you adequate time to examine all the student work.

Charlie Feldhaus
Student Poster Chairman

Poster Listing

An Alternative Technique for Wind Turbine Efficiency Testing Using a Full Scale Model
David Peretz, Joe Nugent
Rochester Institute of Technology

Autonomous Airplane
Nathaniel Colson, Andrew Strange
Taylor University

Extended Length Integer Calculator Implemented in an FPGA
Austin Beer
Taylor University

Collaborative Engineering
V. Jovanov, M. Lei, Q. Li, M. Tomovic
Purdue University

Communications On Board: A Small Satellite Command, Data Handling, and Ground Communications System
Nathaniel Colson, Andrew Strange
Taylor University

Complete ECE Lab in a Box
Charie Key, Devyash Goel
Rose-Hulman Institute of Technology

Computational Modeling of Gas Phase Combustion Reactions
Mark Vaccari
Rose-Hulman Institute of Technology

Construction Supply-Chain Management Based on RFID Technology
Matt Boyle
IUPUI

Conversion of a High-Power SCR Design from Through-Hole to Surface-Mount Components
Leyland Robinson, Nicholas Slabaugh, Brandon Martin, David Sanders
Rose-Hulman Institute of Technology

Data Communication-Based Sonar System
Hillary Hanson, Robert Lauer, Stephen Schnelle, Thomas Werne
Rose-Hulman Institute of Technology

Delivering Core Engineering Concepts to Secondary Level Technology Students
J. Daughtery, M. Westrick, Y. Zeng
University of Illinois at Urbana-Champaign

Design and Development of a Touch Screen LCD Panel for a Hybrid Vehcile
Idris Abdul Hafiz, Caleb Harper, Steven Morey, Scott Parks
Rose-Hulman Institute of Technology

Design of a Mini-Mall for Rockville, Indiana
Bruce Boehl, Todd Clementoni, Christopher Hollen, Kellen Hurst
Rose-Hulman Institute of Technology

Development of a DATA Acquisition and Interface Module for a 500 W Hydrogen Fuel-Cell Power Station Using LabView PDS v8.20
Faruk Yildiz, Kenan Baltaci
University of Northern Iowa

Educational Audio Exhibit at the Indiana Mile
David Hargis, Shane Jeffries, George Saunders, Anthony Youst
Rose-Hulman Institute of Technology

Estates at Greenfield Country Club
Peter Flynn, John Kats, J. Matthew Lash, Stephen Rowe, and Ryan Schipper
Rose-Hulman Institute of Technology

Fixed-Point Single Side Band Implementation Via LabVIEW and C
Keith Godin, Andrea Leichtman, Alex Cook
Rose-Hulman Institute of Technology

Indiana's Organizational Centenarians and Their Five Secrets to Longevity
Mallory Brooks, John Elder, Nathaniel Bonich
IUPUI

Infant Temperature Monitor
Noah Desch, Bryan Jefferson, Joseph Rottman, William Whitehouse
Rose-Hulman Institute of Technology

Investigation of Viscous Flow Through Micro-Orifices
Brandon Hathaway
Rose-Hulman Institute of Technology

LITE WAVE: A Leadership Team for Technical Students
Brandon Clinard, Meghan Johnson, Judith Kirchner, Sam McCauly, Susan Skowera, Kimberly Warwick
Illinois Valley Community College

Making Snow and Ice Removal More Environmentally Friendly
Christopher Armstrong, Mark Johanning, William Kenny, David McIlwaine, Robert Wilson
Rose-Hulman Institute of Technology

Matrix Multiplication Using Quantum-Dot Cellular Automata
Joshua Wood
Valparaiso University

Metal Gear Robot
Josh Hrach, Jose Garcia, Adam Fincher, Valentine Coker
DeVry University

Modeling of Air Gap Between Clothes and Body Surface
Anish Kumar Krishnan Ravindran
Central Michigan University

Noise Reduction in Analog CMOS VLSI Circuits Using Guard Rings for Gigahertz Frequency Transmission of Microvolt Level Bioelectric Signals
Nilashis Dey, Kevin Mauser
Purdue University

Obodan Sustainable Development Center
Joel Anderson, Yaw Aning, Matthew Childs, Richard Franko, Kristin Miller
Rose-Hulman Institute of Technology

Peltier Module Auxiliary Cooling System
Mike Sheridan
IUPUI

Push/Pull Force Sensor for LEGO NXT Robotics System
Lon Farr, Sarah Hegeman, Tony Homan, Nathan Shomber
Rose-Hulman Institute of Technology

Race Car Vehicle Dynamics Analysis
Lynsey Tilton
IUPUI

Roles of Mental Models in Engineering Re-Design
Yong Zeng
University of Illinois at Urbana-Champaign

Service Learning in a Large Scale Software Development Project
Roy Robertson, K. Lutes, S. Agal
Purdue University

Scheduling and Substitution System for the Rose-Hulman Institute of Technology Sports and Recreation Center
Benjamin Feng, Benjamin Fritz, Trevon Sutton, Andrew Toth
Rose-Hulman Institute of Technology

Solar Deck Water Heater
Jill Stackpole
Rochester Institute of Technology

Structural Systems Teaching Module
Shanna Schmelter
Purdue University

Telescope Guidance System
Joel Derby, Matt Longbrake, Joe Moder, Adam Reynolds
Rose-Hulman Institute of Technology

Estates at Greenfield Country Club
Peter Flynn, John Kats, J. Matthew Lash, Stephen Rowe, and Ryan Schipper
Rose-Hulman Institute of Technology

Vehicle Proximity Detection and Collision Avoidance System
Otabek Oblokulov, Chirag Patel, Phillip Villaflor, Aguirre Flavio
DeVry University

Wireless TV Performance Characterization
Jeff Blair, Josh Fakes, Jeff Onsrud, Brad Pickett
Rose-Hulman Institute of Technology

Tours & Activities Available

Indianapolis Motor Speedway Hall of Fame Museum

- On the grounds of the Indianapolis Motor Speedway
- Easy access from the Brickyard Crossing hotel
- Features over 75 historic racing cars plus vintage and classic street cars
- Displays of engines, trophies, helmets, historic photos, and memorabilia
- Indy 500 Gift Shop
- A trip around the track on a shuttle bus is available
- Museum admission is only $3
- Open 9:00 am – 5:00 pm seven days each week

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Indianapolis Motor Speedway Grounds Tours

- Go behind the scenes at the Indianapolis Motor Speedway
- 1.5 hour narrated tour of the oval track, media center, timing and scoring center, victory platform, garage area, Gasoline Alley suites, and the famous “yard of bricks” start/finish line
- Charge is $25 per person with reservations suggested – call 317-492-6747 or email mgeiss@brickyard.com
- Tours at 8:30, 9:30, 10:00, 10:30, and 11:30 March 30-April 1.