

RICHARD J. FASENMYER

# Engineering Design Conference

MAY 2, 2009

## SCHEDULE OF EVENTS

7:30 a.m.	Refreshments: Clark Café (available throughout the event)
8:00–11:30 a.m.	Senior Presentations: Half-hour sessions including Q&A
11:45 a.m.–12:15 p.m.	Keynote Speaker: Black Conference Center, REDC 180
12:30–1:00 p.m.	Class Pictures: ECET 12:30, ECSE 12:35, ME 12:40, MET 12:45, and PLET 12:50. Main staircase steps; assemble in Clark Café.



## KEYNOTE SPEAKER

**Dr. Michael J. Mankosa** is vice president of operations for Eriez Magnetics, a position he has held since 2003. His responsibilities include research and development, engineering, information systems, and manufacturing operations. Mankosa first joined Eriez Magnetics in 1997 as the company's technical director.

Previously, Mankosa served as director of research and development for CarpcO, Inc. in Jacksonville, Fla. During his tenure, he was responsible for research and development efforts that led to several new process and equipment patents.

Mankosa earned his doctorate in mining and minerals engineering from Virginia Polytechnic Institute and State University (Virginia Tech) in Blacksburg. His graduate work focused on the design, instrumentation, and control of process equipment.

He has had more than eighty articles published in scientific and technical journals, obtained seven equipment and process patents, and has received more than \$2 million in research funding from various state and federal agencies.

Professionally, Mankosa is a member of the American Institute of Mining, Metallurgical, and Petroleum Engineers; the Minerals, Metals, and Materials Society; the Instrument Society of America; the American Foundry Society; and the Coal Preparation Society of America.

In addition, he has been recognized as Outstanding Young Engineer (1994) by The American Institute of Mining, Metallurgical, and Petroleum Engineers and honored with the Virginia Tech Alumni of the Year award, among others.

## ABOUT THE CONFERENCE

The Richard J. Fasenmyer Conference showcases the results of year-long, School of Engineering senior capstone projects supervised and managed by students and guided by their faculty and industry advisers. In many cases the projects address applied problems posed by industrial sponsors.

In 2005 the conference was named to honor the legacy of Richard J. Fasenmyer. Mr. Fasenmyer was named an Alumni Fellow and Distinguished Alumnus of the University. He was the first alumnus of Penn State Behrend to donate \$1 million to the college.

PENNSTATE



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College

# Senior Presentations

## COMPUTER SCIENCE

**9:00 a.m. *Multi-Threaded Modeling of Amorphous Materials***

REDC 104 Joseph Synowka  
Dr. Blair Tuttle, faculty adviser

**9:30 a.m. *Graphical Authentication Password System***

REDC 104 Richard Anderson, Jeffrey Karstaedt, Matthew Ohler  
Mr. Charles Burchard, faculty adviser

**10:00 a.m. *Graph Algorithm Visualizer***

REDC 104 Christopher Hoffman, Jack Horst, Geoffrey Osborne  
Mr. Charles Burchard, faculty adviser

**10:30 a.m. *Statistical Arbitrage Investing***

REDC 104 Timothy Herzog, David Miller, Thomas Zajac  
Dr. Joseph Previte, Mr. Ronald DelPorto, faculty advisers

## ELECTRICAL, COMPUTER, AND SOFTWARE ENGINEERING

**8:30 a.m. *RFID I/O Controller***

REDC 102 RFID Center of Excellence, sponsor  
Justin Alward, Clinton Etzel, Jeremy Grossman  
Dr. Shouling He, faculty adviser

**8:30 a.m. *Robotics Guide Cane for the Visually Impaired***

REDC 105 Michael Bottorf, Jason Frisk, Ahmad Salim  
Dr. Vibhuti Davé, faculty adviser

**9:00 a.m. *Environmental Energy Scavenging for Low Powered Applications***

REDC 102 Impact Technologies, LLC, sponsor  
Patrick Combes, Cody Griffin, Matthew Yandrick  
Dr. Sudarshan Nelatury, faculty adviser

**9:00 a.m. *Cellular Based Diagnostic Communication System***

REDC 105 GE Transportation, sponsor  
Matthew Settlemyre, Stephen Sowansky, Daniel Svidunovich  
Dr. Kathy Muhonen, faculty adviser

**9:30 a.m. *Home Energy Monitoring and Management System***

REDC 102 David Bertolasio, Stephen Orosz, Jacob Wehrheim  
Dr. Sudarshan Nelatury, faculty adviser

**9:30 a.m. *Audio Processing Light Show Generator***

REDC 105 Volt Vision, sponsor  
Jacob Peters, James Price, Travis Vargo  
Dr. Kathy Muhonen, faculty adviser

**10:00 a.m. *Web-based Parking Lot Monitoring System***

REDC 102 Transportation-Technologies, Inc., sponsor  
Jeremy Martin, Joseph Root, Troy Silloway  
Dr. Wen-Li Wang, faculty adviser

**10:00 a.m. *Deploying a Web Portal Using Cloud Computing***

REDC 105 Northrop Grumman, sponsor  
Brian Auth, Andrew Keen, James Root  
Dr. Xiaocong Fan, faculty adviser

**10:30 a.m. *Refactoring of an Online Payroll System***

REDC 102 Distributed Network Software, LLC, sponsor  
Alejandro Nieto, Peter Santimauro  
Dr. Wen-Li Wang, faculty adviser

**10:30 a.m. *Mobile RFID Package Tracking System***

REDC 105 RFID Center of Excellence, sponsor  
Lenny Le, Brad Lytle, Benjamin Skrypski  
Dr. Xiaocong Fan, faculty adviser

**11:00 a.m. *A Modular Diagnostic Processing Platform***

REDC 102 Impact Technologies, LLC, sponsor  
Jeremie Davis, Hoa Doan, Robert Stumbaugh  
Dr. Chris Coulston, faculty adviser

**11:00 a.m. *The Smart Tool Holder***

REDC 105 Benjamin Girt, Edward Jacobs, Matthew Tritt  
Dr. Thomas Hemminger, faculty adviser

## ELECTRICAL AND COMPUTER ENGINEERING TECHNOLOGY

**8:30 a.m. *Wireless Monitoring of Machine Tool Health***

REDC 206 Justin Adams, Michael Barry, Katherine Copeland  
Mr. David Loker, faculty adviser

**9:00 a.m. *PLC-based Bulk Weighing Machine***

REDC 206 Process and Data Automation, sponsor  
Brett Badowski, Ross Depanfilis, Martin Haines  
Mr. Roger Kuntz, faculty adviser

**9:30 a.m. *Siemens PLC Using Profibus***

REDC 206 Process and Data Automation, sponsor  
Cody Biddle, James Salerno  
Mr. Roger Kuntz, faculty adviser

**10:00 a.m. *Credit Card Game Board System***

REDC 206 Sam and Irene Black School of Business, sponsor  
Dominique Melvin, Jason Williams, Thomas Ziegler  
Dr. Robert Weissbach, faculty adviser

**10:30 a.m. *Renewable Energy Project***

REDC 206 Eric Batchelor, Eric Marlatt  
Dr. Robert Weissbach, faculty adviser

**11:00 a.m. *Wall-mounted Surgical Light Control and Power Supply***

REDC 206 Nuvo Surgical, sponsor  
Jereme Kirsch, Babajide Opeola  
Mr. Ronald Krahe, faculty adviser

## MECHANICAL ENGINEERING

**8:00 a.m. *Design of a Baseframe for a Diesel-Electric Generator for Marine Applications***

REDC 106

GE Transportation, sponsor  
Andrew Cotherman, Louis Kobielski, Alan Lanzel,  
Robert Theuret  
Dr. William Lasher, faculty adviser

**8:00 a.m. *Redesign of a Locomotive Cab Assembly to Reduce Welding***

REDC 107

GE Transportation, sponsor  
Daniel Dimon, Nicholas Petrus, James Wolfe  
Dr. Dipo Onipede, faculty adviser

**8:30 a.m. *MD-90 Engine Mount Scrap Prevention Initiative***

REDC 106

LORD Corporation, sponsor  
Julianna Barko, Samuel Caraballo, Joshua Castiglione,  
Aaron Ross  
Mr. Dean Lewis, faculty adviser

**8:30 a.m. *Design of a Cart for Flipping Large Pieces of Glass***

REDC 107

Corning Incorporated, sponsor  
Laura DeWalt, Kensaku Matsushita, Julie Oggier,  
Michael Savacool  
Dr. John Roth, faculty adviser

**9:00 a.m. *Single Axis Throttle Controller for Mining Equipment***

REDC 106

Brookville Equipment Company, sponsor  
Michael Floro, Justin Ford, Jason Maher, Benjamin Wigg  
Mr. Dean Lewis, faculty adviser

**9:00 a.m. *Design of a Process for Measuring Two-Phase Flow***

REDC 107

Dresser-Rand, sponsor  
Erin Kiesel, Kurt Poeppel, Matthew Tanner  
Dr. Jun Zhou, faculty adviser

**9:30 a.m. *Designing Measurement and Environmental-Control Systems for a Biaxial Testing Machine***

REDC 106

Adam Druga, Ashraf Khalifa, Philip Witt  
Dr. Russ Warley, faculty adviser

**10:00 a.m. *Design of a Speed-Regulating Device for Manual Wheelchairs***

REDC 106

Dr. Gertrude A. Barber National Institute, sponsor  
Zachary Curran, Craig Pepper, Corey Sutter, Mark Walker  
Mr. David Forsman, Dr. William Lasher, faculty advisers

**10:00 a.m. *Design of a Solder Oven Tray for Filters***

REDC 107

Spectrum Control Inc., sponsor  
Jordan Geibel, Matt Marinelli, Gregory Pawluk, Kyle Say  
Dr. Amir Khalilollahi, faculty adviser

**10:30 a.m. *Design of a Drilling Fixture for Trash Bin Drain Holes***

REDC 106

Rehrig Pacific Company, sponsor  
Patrick Extein, Ramsey Hejazi, Michael Milne,  
Gregory Zetwo  
Dr. Fadi Abu-Farha, faculty adviser

**10:30 a.m. *Design of a Device for Separation of Medical Blister Packets***

REDC 107

McKesson Automation, sponsor  
Glenn Davis, Drew Seker, D. Scott Souerwine,  
William McGraw  
Dr. Amir Khalilollahi, faculty adviser

***Design of Shifting System for PowerShift Bicycle Transmission (not presenting)***

Mr. Joe Lane, sponsor  
Joshua Jones, Timothy McClelland, Timothy McNeal  
Wesley Salandro  
Dr. Russ Warley, faculty adviser

***Adjustable Height Platform Design for the Neutralization of Explosive Devices (not presenting)***

RE2, sponsor  
Carmelo Allegra, Patrick Barraclough, Mario Campagna  
Nigel Schneider  
Dr. John Roth, faculty adviser

## MECHANICAL ENGINEERING TECHNOLOGY

**8:00 a.m. *Development and Design Integration of Torsional Damper with Flexible Couplings (closed session)***

REDC 207

LORD Corporation, sponsor  
Thomas Coyer, Michael Horning, Seth Merry  
Mr. Shannon Sweeney, Mr. Michael Lobaugh, faculty advisers

**8:30 a.m. *Tuned Vibration Absorber for Soil Rammer Handle (closed session)***

REDC 207

LORD Corporation, sponsor  
Jeffrey Glodzik, Jason Grant, Anthony Zimmerman  
Mr. Michael Lobaugh, Mr. Shannon Sweeney, faculty advisers

**8:30 a.m. *Multi-Stage Steam Turbine Governor Valve Positioning System***

REDC 208

Dresser-Rand, sponsor  
Donald Binda, Keith Coleman, Joseph Spess  
Mr. David Johnson, faculty adviser

**9:00 a.m. *Lifting Lug Design Procedure***

REDC 207

Eriez Magnetics, sponsor  
Leonard Nick, David Schmoyer, Justin Scherba  
Mr. Michael Lobaugh, faculty adviser

## MECHANICAL ENGINEERING TECHNOLOGY CONTINUED

**9:00 a.m. *Two Degrees of Freedom Duct Resonator Array Cost Reduction (closed session)***  
REDC 208

Dresser-Rand, sponsor  
Brandon Cook, Francis Kocher III, Jeffrey O'Boyle  
Mr. Shannon Sweeney, Mr. David Johnson, faculty advisers

**9:30 a.m. *Vibratory Stand Off Heat Transfer Analysis***  
REDC 207

Eriez Magnetics, sponsor  
James Darr, Kevin Hobbs, Ryan List  
Mr. Robert Edwards, Mr. Michael Lobaugh, faculty advisers

**9:30 a.m. *Redesign of Plastic Bag Extruder Components***  
REDC 208

Brian Best, Jordan Collette, David Exler  
Mr. Edward Evans, Mr. Jon Meckley, faculty advisers

**10:00 a.m. *Nema 4 Ventilation System for an X-Ray Enclosure***  
REDC 207

Eriez Magnetics, sponsor  
Shawn Danowski, Cory Keck, Zachary Zombek  
Mr. Robert Edwards, Mr. Michael Lobaugh, faculty advisers

**10:00 a.m. *Design, Analyze, and Build Next Generation Shock Caster***  
REDC 208

Corry Rubber, sponsor  
Kevin Hines, Jack Smail, Timothy Ward  
Mr. Robert Michael, faculty adviser

**10:30 a.m. *Boiler Heat Transfer System***  
REDC 207

Bram Alackness, Alan Eagan, Walter Taylor  
Mr. Richard Englund, Mr. Thomas Briselden, faculty advisers

**10:30 a.m. *Advanced FEA Modeling of Seismic Isolator***  
REDC 208

Vincent Civitarese, Kurt Gausman, Aaron White  
Mr. Robert Michael, faculty adviser

**11:00 a.m. *Analysis and Design of a Continuous Induction Furnace***  
REDC 207

Philip Busi, Justin Chesley, Joshua Kevech  
Mr. Kenneth Fisher, Mr. Thomas Briselden, faculty advisers

## PLASTICS ENGINEERING TECHNOLOGY

**8:00 a.m. *Unmanned Air Vehicle and Usage Monitoring System Enclosure (closed session)***  
REDC 201

Impact Technologies, LLC, sponsor  
Ryan Sanislo, Michael Wahl  
Mr. John Beaumont, faculty adviser

**8:00 a.m. *Characterization of Polymer Flow Through Small Gaps (closed session)***  
REDC 204

Husky Corporation, sponsor  
Cory Lischerelli, James Michalenko  
Mr. Bradley Johnson, faculty adviser

**8:30 a.m. *A Study of Anisotropic Shrinkage and Its Relationship to Warpage in Injection Molded Parts***  
REDC 201

Jason Bonfili, Matthew Piatek  
Mr. John Beaumont, faculty adviser

**8:30 a.m. *Evaluation of Tooling Wear in Small Channels During Injection Molding (closed session)***  
REDC 204

Husky Corporation, sponsor  
Brian Nguyen  
Mr. Bradley Johnson, faculty adviser

**9:00 a.m. *The Effect of Gate Width on Packing During Injection Molding***  
REDC 201

John Wodzinski  
Mr. John Beaumont, faculty adviser

**9:00 a.m. *Injection Molding of NanoComposites I (closed session)***  
REDC 204

Respironics, sponsor  
Thomas Martz, Cassandra Miksic  
Mr. Bradley Johnson, faculty adviser

**9:30 a.m. *Thermal and Shear Degradation of PolyLactate (PLA) During Injection Molding***  
REDC 201

Theodore Bly, Ashly Wetzel  
Mr. John Beaumont, faculty adviser

**9:30 a.m. *Injection Molding of NanoComposites II (closed session)***  
REDC 204

Respironics, sponsor  
Justin Bonfili, Jack Rulander  
Mr. Bradley Johnson, faculty adviser

**10:00 a.m. *Evaluation of Extrusion Simulation Software***  
REDC 201

Michael Leo, Gregory Madru  
Mr. Jon Meckley, faculty adviser

**10:00 a.m. *Effect of Environmental Exposure on Materials Based on Blends of Plasticized Starch and Polypropylene***  
REDC 204

Michael Forbes, James Goetz  
Mr. Brian Young, faculty adviser

**10:30 a.m. *The Effect of Shear Induced Imbalances on Cure Time and Degree of Cure for Injection Molded Phenolics***  
REDC 201

Paul Baird, John Kraynik  
Mr. Jon Meckley, faculty adviser

**10:30 a.m. *Determining the Accuracy of CAE on Gas-Assist Molding Simulation***  
REDC 204

Ryan Williams  
Mr. Brian Young, faculty adviser

**11:00 a.m. *UV Investigations into Film Coverings for Leuco Dyes***  
REDC 201

Hazzard Guard, sponsor  
Courtney Flickinger, Beth Manganaro  
Mr. Jon Meckley, faculty adviser

**11:00 a.m. *Determination of Material Property Changes Due to Combining Flow Fronts***  
REDC 204

George Koleck, Jared Spaniol  
Mr. Brian Young, faculty adviser