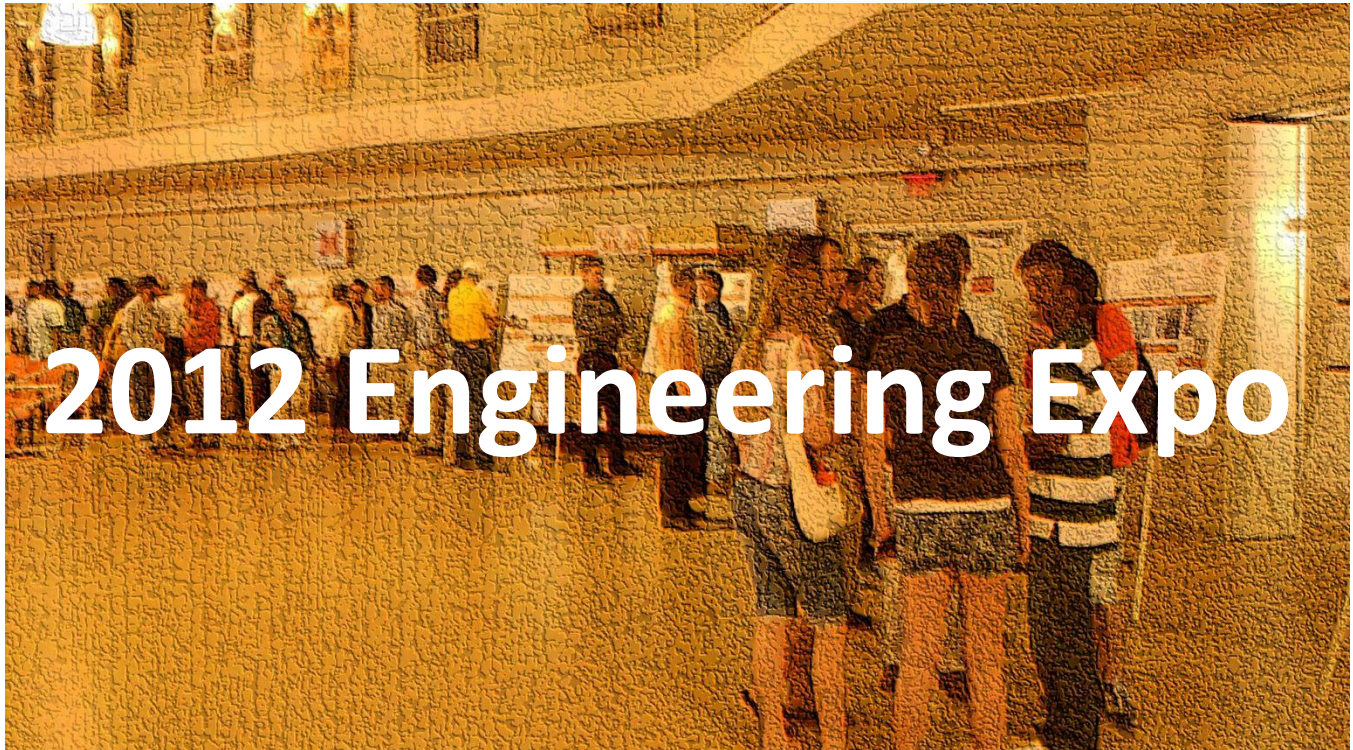




**MERCER ENGINEERING**

*Different by design*



# 2012 Engineering Expo

**Science and Engineering Building  
&  
The University Center Arena**

**Mercer University  
April 19, 2012 9:00 AM – 5:00 PM**

**MERCER**  
UNIVERSITY

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**Welcome**

**SEB 104**

**9:20 AM – 9:25 AM**

**Dr. Wade H. Shaw, P.E.**  
**Dean of School of Engineering**

**Podium Presentation I**

**09:30 AM – 11:30 AM**

**Session A**

**SEB 110**

**Moderator: Dr. Wade Shaw**

09:30 AM – Dr. Wade H. Shaw, P.E.  
09:55 AM

**Meta-Modeling for Design Synthesis: Application to the Supplemental Instruction Program for Engineering Students**

10:00 AM – J. Andrew Jones, Dr. Laura Lackey  
10:25 AM

**Equilibrium and Kinetic Analysis of Fluoride Adsorption on Bone Charcoal**

10:30 AM – Jason Ryans, Dr. Sinjae Hyun  
10:55 AM

**Computational Investigation of Particle Deposition in a Realistic Human Lung Airway Model**

11:00 AM – Chris Menard, Dr. Joe Sam Robinson,  
11:30 AM Dr. M. Sami Walid, Dr. Sinjae Hyun,  
Robert O'Connell, Brandi Bohleber

**Computational Modeling of HHH Therapy and Impact of Blood Pressure and Hematocrit**

**Session B**

**SEB 143**

**Moderator: Dr. Paul MacNeil**

09:30 AM – Dr. Scott Schultz, Dr. Paul MacNeil  
09:55 AM

**Scheduling Radar Warning Receivers (RWRs)**

10:00 AM – Dr. Paul E. MacNeil  
10:25 AM

**Computing, Equations, and Molecular Structure**

10:30 AM – Jamie Oakley, Kristin Marko, Mario do  
10:55 AM Nascimento, Dr. Sinjae Hyun

**Temperature and Moisture Controlled Three-Dimensional Tracheobronchial Lung-Airway**

**Session C**

**SEB 144**

**Moderator: Dr. Philip McCreanor**

09:30 AM – Dr. Philip T. McCreanor, Kevin Berry  
09:55 AM

**Financial Comparison of Dry Tomb and Bioreactor Landfills**

10:00 AM – Alfred Jason Kamczyc, Derek Munday,  
10:25 AM Dr. Philip McCreanor

**Wireless Attention Acquiring Device (Wireless AAD)**

10:30 AM – Dr. Philip T. McCreanor, Douglas  
10:55 AM Doud, Nand Patel and Justin Pritchard

**Landscape irrigation with gray water**

11:00 AM – Mike Harding, Jeffrey Crow, Zach  
11:25 AM Colaprete, Dr. Sinjae Hyun

**To Design, Test, and Build a Breathing Machine Apparatus for use in the MUSE Particle Delivery Laboratory**

**Session D**

**SEB 201**

**Moderator: Dr. Anthony Choi**

09:30 AM – Andrew Weems, Dr. Ha Van Vo, Dr.  
09:55 AM Phillip McCreanor

**Novel Design for Total Finger/Toe Joint Replacement**

10:00 AM – Kevin Eck, Dr. Philip McCreanor  
10:25 AM

**Novel Spherical Robot Design**

10:30 AM – Thomas Quigley, Jana Blust, Thomas

**The International Aerial Robotics Competition**

10:55 AM	Evans, Dr. Anthony Choi	
<b>Session E</b>	<b>SEB 202</b>	<b>Moderator: Dr. Behnam Kamali</b>
09:30 AM – 09:55 AM	Jared Wozny, Dr. Laura Lackey	Mathematical Modeling of Intermittent Flow Biological Sand Filters
10:00 AM – 10:25 AM	Dr. Behnam Kamali	The Development of Aeronautical Mobile Airport Communications Systems; AeroMACS
10:30 AM – 10:55 AM	Micah Esmond, Jacob Hopkins, Barrington Richards II, Dr. Loren Sumner, Dr. Kevin Barnett	Wind Turbine Generator and Instrumentation

## Lunch

**11:00 AM – 1:00 PM**

Lunch @ the Plaza Served by Tau Beta Pi and IIE  
Lunch at the Quad served by the Fresh Food

## Freshmen Design Competition

**1:00 PM – 3:00 PM**

The University Center Arena  
1:00 PM – 3:00 PM  
Dr. Michael Leonard  
Senior Associate Dean, School of Engineering

## Poster Presentation

**3:00 PM – 4:30 PM**

The University Center Arena

### Senior Design Track

1	Mike Harding, Jeffrey Crow, Zach Colaprete, Dr. Sinjae Hyun	To Design, Test, and Build a Breathing Machine Apparatus for use in the MUSE Particle Delivery Laboratory
2	Ethan Garrett, Ben Haygood, Kyle Sutton, Bobby Washington, Dr. Jack Mahaney, Dr. Kevin Barnett, Dr. T. Anthony Choi	Low Cost Remotely Operated Mine Detector
3	Micah Esmond, Jacob Hopkins, Barrington Richards II, Dr. Loren Sumner, Dr. Kevin Barnett	Wind Turbine Generator and Instrumentation
4	Brannen Chapman, Rashele Moore, Alex Perry, Dr. Ha Van Vo	Human Powered Water Pumping System
5	Kimberly Camerino, Louis Sansone, Andrew Hyatt, Dr. Kevin Barnett	Large Capacity Accurate Personal Coffee Roaster
6	KaLia Burnette, Kenny Tang, Griffin Pafford, Dr. Ha Van Vo, Dr. Richard Kunz	Improved Universal Trans-Femoral Prosthetic for Above-Knee Amputees
7	Nick Booker, Martin Joubert, Kevin Roberts, Dr. Loren Sumner	Gas Turbine Electric Power Module
8	Toks Adebayo, Andrew Weems, Dr. Sinjae Hyun	Measurement of Abdominal Aortic Aneurysm Migratory Forces
9	Thomas Quigley, Jana Blust, Thomas	The International Aerial Robotics Competition

	<b>Evans, Dr. Anthony Choi</b>	
10	<b>Paul Adams, Kristen Alston, Christopher Crook, Dr. Joan M. Burtner, Dr. Anthony Choi, Dr. Loren Sumner</b>	<b>Solar and Wind Potentiometer</b>
11	<b>Jennifer Goodman, Andrew Simms, Kristen Wyckoff, Dr. Laura Lackey</b>	<b>The Use of Ozonation to Improve the Treatability of Pulp and Paper Mill Effluent</b>
12	<b>Nathan Burnham, Elias Hall, James Herring, Dr. T. Anthony Choi</b>	<b>Embedded Robotics Platform</b>
13	<b>Robert Bennett, Jessica Pippard, Tim Samson, Dr. Ed O'Brien</b>	<b>Arterial Pulse Velocity Instrument</b>
14	<b>Matt Baker, Eric Reid, Cory McDuffie, Dr. Loren Sumner</b>	<b>Hydrogen Fuel Cell Laboratory</b>
15	<b>Jamie Oakley, Kristin Marko, Mario do Nascimento, Dr. Sinjae Hyun</b>	<b>Design and Creation of a Temperature and Moisture Controlled Three-Dimensional Tracheobronchial Lung-Airway – Part I.</b>
16	<b>Jamie Oakley, Kristin Marko, Mario do Nascimento, Dr. Sinjae Hyun</b>	<b>Design and Creation of a Temperature and Moisture Controlled Three-Dimensional Tracheobronchial Lung-Airway – Part II.</b>
17	<b>Rob Machen, Joshua Abarra, Dr. Hodge Jenkins, Dr. Jack Mahaney</b>	<b>MUSE Soapbox Car</b>

### **Student Research Track**

18	<b>Brad Stout, Awab Khan, Vinh Nguyen, Dr. Sinjae Hyun</b>	<b>Modeling Ideal Temperature of Diminutive Laser Pulse to Treat Breast Cancer Utilizing Gold Nanoparticles</b>
19	<b>Kalia Burnette, Caitlyn Ryan, Dr. Ha Van Vo &amp; Dr. Laura Lackey</b>	<b>A Comparative Analysis of Coconut Based filter VS a basic sand filter</b>
20	<b>Laura López Sosa, Katie Safford, Paige Sforzo, Dr. Philip McCreanor</b>	<b>Lab Scale Evaluation of Sand Filters for On-site Sewage Management in Georgia</b>
21	<b>Anthony Fratino, Bich Nguyen, Tapas Misra, Dr. Sinjae Hyun</b>	<b>Heat Transfer of Bone Cemented Femur Anthroplasty</b>
22	<b>Alfonso Sciacchitano, DoHyun Yoon, Michael An, Nand Patel, Dr. Sinjae Hyun</b>	<b>Thermal Effects of Hydrotherapy for Swelling Reduction on Lower Extremities</b>
23	<b>Jason Ryans, Dr. Sinjae Hyun</b>	<b>Experimental Investigation of Particle Deposition in a Realistic Human Lung Airway Model</b>

### **Honors Program Track**

### **Freshman Honors**

24	<b>Ethan Arrendale, Dr. Philip McCreanor</b>	<b>Video Analysis of Linear Martial Arts Techniques Using LoggerPro 3.8.3</b>
25	<b>Jonathan Atzmon, Dr. Philip McCreanor</b>	<b>Remote Monitored and Controlled Horse Watering System</b>
26	<b>Hunter Hickman, Laila Wise, Dr. Philip McCreanor</b>	<b>Encoding of Electronic Messages using the Enigma Technique</b>
27	<b>Brett Eckles, Bradley Young, Dr. Philip McCreanor</b>	<b>Determination of the Force Required to Break Boards</b>
28	<b>Joel (JT) James, Dr. Philip McCreanor</b>	<b>3D Image Processing</b>

29	Kevin Tagoe, Dr. Philip McCreanor	Alternative Power Turbine Design
30	Patrick Morris, Dr. Philip McCreanor	Impact of a Car's Rear Spoiler on Lift and Drag Forces
31	James Wischmeyer, Dr. Philip McCreanor	Evaluation of Trebuchet Dynamics

### Honors Program Track

### Sophomore Honors

32	Molly Safigan, Dr. Susan Codone	What is Technical Communication
33	Erin (Mitzi) Brett, Dr. Laura Lackey	The Anti-microbial Affects of Several Forms of Copper
34	Emily Brett, Dr. Philip McCreanor	Biomechanics of Isotonic Exercises
35	Bryan Danley, Dr. Philip McCreanor	Determining Accuracy of ModelSmart v1.72 Bridge Modeling Software
36	Edward Lacey, Dr. Laura Lackey	Comparative Modeling of Full-Scale and Small-Scale Biosand Filtration Systems
37	Carl Aquino, Joshua Deremer, Dr. Philip McCreanor	A-maze-ing Robot
38	Emily Minch, Alexander Newell, Dr. Philip McCreanor	Programming a Particulate Filtration System into Second Life
39	Daniel Yoon, Anthony Fratino, Dr. Sinjae Hyun	Aerosol Deposition Study of Subject-specific Upper Respiratory Model
40	Kyle Wright, Dr. Philip McCreanor	Activated Sludge Aeration Basin in Second Life
41	Matthew Yin, Dr. Philip McCreanor	Drag Force Analysis of Tractor-Trailer Aerodynamics

### Honors Program Track

### Junior Honors

42	Kevin Eck, Dr. Hodge Jenkins	A Novel Drive System for a Spherical Robot
43	Alan Westbay, Dr. Philip McCreanor	Bench-scale Demonstration of Flywheel Energy Storage
44	Alfred Kamczyc, Dr. Philip McCreanor	Wireless Attention Acquiring Device
45	Kathryn Mason, Dr. Philip McCreanor	Construction and Testing of a Model Steam Engine
46	Andrew Weems, Dr. Ha Van Vo	Alternative Design for a Replacement Finger Joint

### Honors Program Track

### Senior Honors

47	Jones Andrew, Dr. Laura Lackey	Effects of Wind and Effective Emissivity of the Cover on a Passive Solar Still: A Theoretical and Experimental Study
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## Award Announcement

**4:30 PM – 4:50 PM**

Best Presentation Award  
 Best Podium Presentation Award  
 Best Senior Design Poster Presentation Award  
 Best Student Research Poster Presentation Award  
 Best Honors Program Poster Presentation Award

## Closing Commencement

**4:50 PM – 5:00 PM**

Dr. Wade Shaw  
 Dean, School of Engineering