



Engineering Futures

The MTSU Department of Engineering Technology prepares students for a broad range of technical and management positions. Undergraduate majors include Engineering Technology, Concrete Industry Management, Construction Management, and an interdisciplinary major in Environmental Science and Technology. Pre-Professional programs include Pre-Architecture and Pre-Engineering. Graduate majors include Engineering Technology and Occupational Health and Safety.

ET 2009 Open House Showcases Student Talent

By Elizabeth M. Lamb

The third annual MTSU Engineering Technology Open House was a great success, displaying student and faculty presentations and research projects.

The 2009 Open House premiered an awards ceremony to recognize outstanding students and scholarship recipients.

"We are proud to exhibit departmental talent to the campus community," says department chair, Dr. Walter Boles. "This is an excellent opportunity to introduce our major program areas to interested students. Even during this period of unemployment, technology will continue to drive the economy. Our goal is to build tomorrow's technology careers today."

Dr. Charles Perry, Chair of Manufacturing Excellence, recognized 12 outstanding students in their respective areas of study and 28 scholarship recipients as master of ceremony for ET departmental student awards. Several scholarship donors were on-hand to participate and greet students.

Exhibits included the electro-hybrid retrofitted device for automobiles, a hydrogen fuel cell, rockets, robotics, a space elevator, friction welding, and a hydraulic lever system. Presentations on



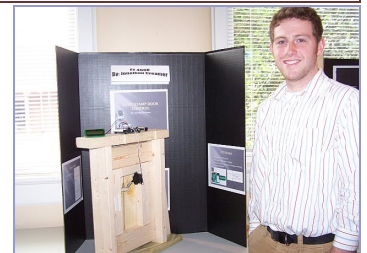
ET Outstanding Students for 2008-2009. Front row left to right: Sarah K. Campbell (Concrete Industry Mgmt.), David S. Taylor (Construction Mgmt., Land Development and Residential Bldg.), Julissa I. French (Pre-Eng.), Johnny P. Guidry (Electro-Mechanical Eng. Tech.), Sherry L. Harner (Graduate Program). Back row left to right: Michael D. McGoldrick (Mechanical Eng. Tech.), Terry R. Allen (Eng. Systems Tech.), Joshua W. Stonebarger (Environmental Science & Tech.), Christopher M. Huseman (Computer Eng. Tech.), Bradley H. Bynum (Construction Mgmt., Commercial Const.)

"Concrete: The Sustainable Building Material" and a "Lead Elimination Economic Impact Study" offered further examples of department research.

Student teams showcased their winning talents, including members of the nationally ranked Construction Management team and Raider Rocket team.

Outdoor presentations included the student-built Formula SAE racer, Mini-Baja, Moon-buggy, and Solar Boat. These award winning experimental vehicles were on display in front of the Tom H. Jackson Building, helping draw the large crowd into the building.

ET students provided an impressive array of talent to the MTSU campus. ✦

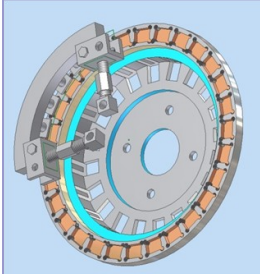


Far left: Dr. Charles Perry and Dr. Boles enjoy the open house festivities. Near left: ET faculty, staff, family and others gather for the open house awards ceremony.

Right hand side: ET students exhibit their creations, including (from top to bottom) a device to prevent doors from slamming, the MTSU award-winning moonbuggy, a unique approach to shooting paintballs, and a remote-controlled firing mechanism.

Russell Chair of Manufacturing Excellence

Dr. Charles Perry submitted the patent for the Plug-in Hybrid Retrofit Kit, which is receiving much attention based on its potential for saving Americans 120 million gallons of fuel daily. Research and prototype assistance is provided by Paul W. Martin III, the automotive engineering technology expert working with Dr. Perry.



Dr. Perry's Wheel Hub Motor Axial Assembly, Patent Pending

Martin's contributions in prototype design and fabrication were major factors in obtaining a very favorable rating from the Tennessee Technology Development Council (TTDC), resulting in a \$50,000 grant from the State of Tennessee. Out of 15 university applications, the wheel hub plug-in hybrid project placed first.

A partnership is established with Palmer Laboratories, Inc. to accelerate the development of the wheel hub plug-in hybrid project by demonstrating a working prototype and scale up

leading to commercial manufacturing. Palmer committed to match the \$50,000 grant from TTDC for a total of \$100,000 to be used to design and build a prototype. As part of the partnership Palmer will have other prototypes fabricated using Engineering Technology facilities.

Another project, the MTSU multi-fuel BioBus is completed with the application of new graphics. It was modified to run on used cooking oil, biodiesel, and petro diesel. The next phase is to set up a process to collect and process the used cooking oil on campus to fuel the BioBus.

Additionally, Dr. Perry secured MTSU as a Project Management Institute (PMI) Registered Education Provider (REP). As an REP, MTSU underwent a rigorous review process by PMI to ensure a higher standard of quality for certification and project management coursework. ✦

Manpower's Annual "10 Hardest Jobs To Fill" Survey, as reported by U.S. employers for 2009, are:

1. Engineers
2. Nurses
3. Skilled/Manual Trades
4. Teachers
5. Sales Representatives
6. Technicians
7. Drivers
8. IT Staff
9. Laborers
10. Machinist/Machine Operators

Even with unemployment at or near record levels in many communities, Manpower's research highlights the problem many employers are having finding individuals with the right combination of job-specific skills, experience, training and soft skills.

"While talk has slowed in the U.S. about the pending talent shortage, it is becoming more clear that there is a talent disconnect," said Melanie Holmes, vice president, world of work solutions for Manpower North America. "Our workforce needs to be more open to retraining and up-skilling for jobs that are in demand. And, our government, business leaders and educational facilities need to take action together to ensure students are being enticed to enter these fields."

www.us.manpower.com ✦

Construction Management Builds on Success

One of the significant milestones reached by the Construction Management program was graduating the first three students from the non-traditional Electrical Construction Management program. They were recognized at the opening ceremonies of the National Training Institute Conference held in Knoxville, Tennessee.

The newest concentration within the Construction Management major is Commercial Construction Management. This program is designed to prepare students for employment as estimators, assistant construction superintendents, project managers, project engineers and supervisors within commercial construction entities.



Construction Management Team, 2009

The Land Development/Residential Building (LD/RB) Concentration received high marks for the first year National Housing Endowment \$100,000 Grant. Finally, the LD/RB student competition team finished in second place at the national Residential Construction Management competition in Las Vegas, Nevada. ✦

Concrete Industry Management Program is Standing Strong

The Concrete Industry Management (CIM) students actively placed in two national competitions this past year:

- CIM came in first place in the Strength Competition at ACI's Fall 2008 Convention in St. Louis, Missouri.
- CIM placed fourth at the Concrete Construction Competition, at the ACI Spring 2009 Convention, in San Antonio, Texas.

Additionally, 73 CIM students participated in undergraduate internships during the 2008-2009 academic year.

CIM research projects included:

- Influence of mixture proportions and curing conditions on freeze and thaw durability of pervious concrete
- Water transport in partially saturated fractured concrete
- Metro Water Pervious Concrete Water Quality
- Characterization and development of patching materials for a concrete bridge deck
- Effects of nano-particles on properties and microstructure of concrete



CIM Students at the 2009 World of Concrete Conference in Las Vegas, Nevada

- Odor Swift Product Demonstration Project at the MTSU Hog Farms
- Development of a high volume fly ash concrete system

Graduate Projects

ET graduate students conducted research projects in significant areas in the past academic year:

- Lead Exposure Costs - Jessica Mera
- New Methods of Employee Training- Jon Smith
- Developments in Powerflex motor controllers and Compact-Logix programmable logic controllers- Soo Wei Kok, David Chen and Imran Ali
- I/O function and sensing of the Mitsubishi MOVEMASTER RV-M1 Robot system - David Chen

Additionally, there was high graduate student participation in industry events sponsored by Tacle Seating USA, Asurion Corporation, Teledyne Technologies, General Mills, Bridgestone/Firestone, Parthenon Metal Works, MAHLE North America, Square D, Tennessee Bun Company and Hewlett Packard Company.

Engineering Technology Highlights

When the name of the department changed in 2008 from "Engineering Technology and Industrial Studies" to "Engineering Technology," it reflected changes in the professional environments our students will enter. Elimination of "Industrial" was desirable since the word, in many minds, is associated with either metal/wood shop or "smokestack manufacturing." Practitioners in engineering technology realize that "Industrial" is high tech, but the perception in the community at large is still "old school."

Engineering Technology students have a more descriptively appropriate definition of their field of study. This change also allowing interested students to find and understand the department's offerings more easily.

Other highlights from the 2008-2009 academic year include:

- Best design award at the University Student Launch Initiative contest in Huntsville, Alabama.
- Election of two ET students to the Student Congress, Nashville Technology Council, T3 Initiative.
- Outstanding Hull Design Award by the Solar Boat Team at the Solar Splash Competition.
- Sixth place in the Mud Bog Racing Event among 124 teams for the Mini-Baja team in Burlington, Wisconsin.
- Research on an "Intelligent Robotic Work Cell" conducted by undergraduates in the Tennessee Louis Stokes Alliance for Minority Participation program.
- First Place Safety Award by the Moonbuggy Team at the Great Moonbuggy Race in Huntsville, Alabama.
- Eighth Place by the Formula SAE Team in the Endurance Competition in Alton, Virginia

Mr. Ken Sergeant, Jr. retired from the ET department in 2008 after 25 years of service.

Mr. Harold Clinton Jewell, former ET assistant professor of 36 years, passed away February 18, 2009.

ET Faculty and Staff Recognitions 2008-2009

Dr. Walter Boles: secured \$100,000 from the National Housing Endowment.

Dr. Carol Boraiko: gave numerous presentations, published numerous works, and recognized for Excellence in Grantsmanship at MTSU by entering the Million Dollar club for HUD-LEAP grants.

Ms. Sally Bradford: helped coordinate the CIM auction for 2009.

Dr. Heather Brown: gave numerous presentations, including NSF/UAB/HBRC Conference in Cairo, Egypt, published numerous works, secured clean energy grant funding and voted an MTSU person who "makes a difference" in 2008.

Dr. Alphonse Carter: secured grant funding for technology engineering education and assisted in established ABC and AGC student chapters at MTSU.

Dr. Chong Chen: secured TAF funding and reviewed publications for Delmar-Cengage and McGraw-Hill.

Dr. Saeed Foroudestan: awarded SAE faculty advisor of the year.

Mr. Fulks: voted an MTSU person who "makes a difference" in 2008 and formed/poured cart paths for the MTSU golf team's new facility.

Mr. David Gore: made numerous presentations, published numerous works, secured funding for software, received distance learning third year service award and voted an MTSU person who "makes a difference" in 2008.

Dr. David Hatfield: gave numerous presentations, elected Vice Chair of the Executive Committee for NAHB Student Advisory Board and helped secure \$100,000 from the National Housing Endowment.

Ms. Kathy Johnson: received the Certified Professional Secretary designation.

Dr. Marcus Knight: gave numerous presentations including courses at Cher-

bourg School of Engineering in Cherbourg France, published numerous works and received the PCI Travel Award.

Ms. Elizabeth Lamb: voted an MTSU person who "makes a difference" in 2008.

Ms. Becky Linville: voted an MTSU person who "makes a difference" in 2008 and spoke at 2009 American School Counselors Association Conf. in Denver.

Mr. Paul Litchy: became MTSU American General Contractors student organization advisor.

Ms. Debbie Londré: presented the artistic rendering of the CIM building campaign in 2009.

Mr. Paul W. Martin, III: developed methods to achieve electric traction for the wheel hub motor design and included in Dr. Perry's patent application.

Dr. Kathy Mathis: gave numerous presentations and recognized for Excellence in Grantsmanship at MTSU by entering the Million Dollar club for HUD-LEAP grants.

Dr. Ronald McBride: represented MTSU at International Manufacturing and Technology conference and developed grant specifications for TAF-funded surface grinder.

Dr. Gerald Morton: awarded new patent, US7,357,833, published numerous works and conducted national ASTM D01.36 subcommittee as chairman.

Dr. Ahad Nasab: gave numerous presentations, secured funding from the Tennessee Space Grant Consortium and received funding awards from various USLI contests.

Dr. Charles Perry: made numerous presentations of the Plug-In Hybrid Wheel Hub Motor, submitted three patent disclosures to TBR and served as Chairman of the Oversight Steering

Committee to recommend methods to reduce MTSU's budget.

Ms. Faye Ralston: presented "Childhood Lead Poisoning in Tennessee" at the for Annual Solid/Hazardous Waste Conference with Drs. Boraiko and Mathis.

Dr. Richard Redditt: published "Industry and University Collaboration of Masters in Eng. Mgmt. Curriculum Design," (with Mr. Gore) for the Journal of Management and Engineering Integration.

Dr. Karim Salman: nominated for "Who's Who for US Teachers"

Dr. Saleh Sbenaty: made numerous presentations, organized the "Seizing and Securing Digital Evidence" workshop, published numerous works and secured federal earmark for forensic science and funding for scholarships.

Ms. Sally Swoape: elected Vice-President of Association of Secretarial and Clerical Employees at MTSU for 2008-2009.

Dr. B.S. Sridhara: presented at the ASEE annual conference, published numerous works, voted an MTSU person who "makes a difference" in 2008 and received instructional grant funding.

Rick Taylor: mentored EVP team students through machine and design support for competitions.

Ms. Jennifer Tweedie: Joined the TN-LEAP office as our department's newest employee.

Mr. Duane Vanhook: Become a director on the National Home Builder's Board and helped secure \$100,000 from the National Housing Endowment.

Ms. Leigh Woodcock: promoted to Coordinator for the TN LEAP East program.

Dr. Zhifu Yang: served as reviewer and editorial manager for "Materials and Structure" journal, published various works. ✦