

Engineering Technology Spotlight 2010

A publication of the MTSU Department of Engineering Technology

Our Open House captured local interest

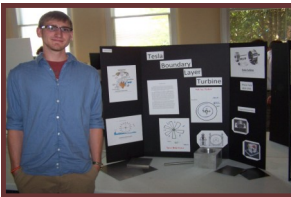


Concrete Countertops!

Our open house is held each spring providing a forum for students and faculty to display their research and projects. Friends and donors are invited to celebrate the successes of our students. Our open house this year was a great event with lots of interested visitors enjoying our displays.



Get the lead out!



Tesla Turbine? It works without blades!



Try these to improve your eye-hand coordination!



and our student projects impressed Chinese.

On October 5-8 MTSU was visited by a delegation from Ningbo University in China. The group of nine administrators toured the laboratories in Engineering Technology with **Dr. Walter Boles** on October 6. They commented about how impressed they were with the number of student projects we have and said they were hoping to emulate this upon returning to China.



10-9-8-7-6-5-4-3-2-1 - We have lift off!

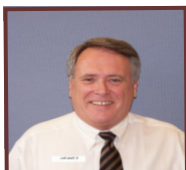


Blue Raider Baja Racer or ideal second car?



Future ET Recruits?

Russell Chair of Manufacturing Excellence



Dr. Charles Perry

Dr. Charles Perry, Russell Chair of Manufacturing Excellence (PI), Dr. Richard Redditt, Dr. Chong Chen, Paul Martin III, Rick Taylor, Alex Kirchhoff, Steven Childress and Jay Perry are members of the team working on the **Plug-In Hybrid Retrofit Kit project**. They have been busy completing the first stage of this project, which was to design, build and evaluate the prototype. This goal was accomplished at the laboratory level and not installed on an actual vehicle due to lack of funding.

In 2010, this project been was on multiple news outlets including WSMV-Channel 4, Fox 17, NewsChannel 5Plus, the Daily News Journal, Sidelines, the Tennessean, Nashville Business Journal, The Nashville Scene, Newswise and posted on 14 websites.

For Stage II, a new industrial partner will be solicited and then a manufacturing prototype will be built. The end product should be available in about two years and will be more universal than first anticipated.

Dr. Charles Perry was visited by **Senator Bill Ketron** on April 16. He was accompanied by **Jimmy Davis**, a Murfreesboro businessman who arranged the meeting. Mr. Davis was impressed by the **Plug-In Hybrid Wheel Hub project** and wanted Senator Ketron to see some of the work going on at MTSU. Senator Ketron reviewed the project and applauded this kind of innovation at MTSU. He emphasized that this was exactly the kind of activity that he supported since it could lead to more jobs in Tennessee.

Engineering Technology (ET)



Professor David Gore instructs ET courses on **Six Sigma** and **LEAN** business methodologies.

What is Six Sigma? Many organizations employ a business management strategy called **Six Sigma** to reduce product variability, defects and waste to nearly zero. As a result, customer satisfaction and business profits increase. Six Sigma involves applying a set of quality management methods (including statistical methods) and creating a special infrastructure of people within an organization (a team) who are experts in these methods. The degree of expertise of a team member is measured and titles are assigned ("Black Belt," "Green Belt," and sometimes yellow and other color belts) according to level of expertise.

Teams for Six Sigma and Industrial Engineering Systems (I.E.) projects have been setup at **Nissan** and **Parthenon Metals-LaVergne**.

- At **Nissan** there are two teams of Six-Sigma graduate and undergraduate students in the Body Plant, one team in the Paint Plant, and two teams in the Trim & Chassis Plant. Several Nissan project teams have already completed I. E. Systems projects. The Six Sigma projects are expected to be completed next semester.

- The graduate/undergraduate team at **Parthenon** will investigate manufacturing issues for root causes of quality concerns.

LEAN projects is another subject that Professor Gore covers and preliminary discussions for next semester have been held with **Walker Industries** in Lewisburg and **Rich's Products** in Murfreesboro.

What is a LEAN project? **LEAN projects** use **LEAN systems**. Definitions of LEAN vary, but at a very high level, this simple and universal definition applies — an organization uses a specific system that gives all levels of employees in the organization the skills and a shared way of thinking to systematically drive out waste.

This is done by designing and improving work activities, connections, and flows. All employees are able to contribute to the success of an organization by acquiring the skills of a learning organization and creating an environment of real-time learning nearest to the problem or point of impact.

Regardless of how they define it, many organizations have had great success creating world-class companies using **LEAN systems**.

Twelve students competed at the 17th Annual **Great Moonbuggy Race**. The race was hosted by **NASA**, in Huntsville, Alabama last April.



Seyha Chhim and Stephanie Price are racing in 2010 Moonbuggy race competition.

The **MTSU Baja Team** participated in the **2010 Society of Automotive Engineers (SAE) Rochester World Challenge** in New York, June 10–13. They placed in the top 40% of more than 90 teams and finished in the top 15 teams for design costs.

Team members were **Steven Childers, David O'Brien, Josh Cantrell, Jordan Wolpert,**



David O'Brien racing at 2010 Baja competition.

Nick DiAngleo, Robert McDaniel, Russell Winfree, Rick Taylor, and advisor, Dr. Saeed Foroudastan.

Dr. Foroudastan is the faculty advisor for the Moonbuggy, Baja and Solar Boat projects.



Lazaro Perez racing in Solar Splash 2010.

The **MTSU Solar Boat Team** sailed confidently into the list of top ten competitors at the 15th annual **Solar Splash World Championship** competition, hosted at Fayetteville Lake by the University of Arkansas this summer.

During the MTSU team's fourth year of competition, students navigated confidently through the qualifying events and secured an 8th place finish.

Each team competes in student-designed and built bateaux (small flat-bottomed boats) that can be no larger than 6 meters (19 ft. 8 in.) X 2.4 meters (7 ft. 10.5 in.) and must maintain a height of 1.5 meters (4 ft., 11 in.) above the waterline at all times. Each boat is powered by designated batteries

Engineering Technology (ET)

and solar arrays, without assistance from oars, swimmers, or other mechanical means.

MTSU received three honors at this event: **Participation Award** for mastery of the qualifying events, the **Sportsmanship Award** for exhibiting exemplary character and courtesy throughout the competition, and a plaque recognizing their **top ten finish in 8th place**. The 2010 MTSU Solar Boat Team event participants were: **Stan Whitehouse (captain), Lazaro Perez (co-captain), Bryan Bodkin, Raymond Dennis, James Rancaster, Sherry Harner, Paul Martin III, and Dr. Saeed Foroudastan.**



The **MTSU Raider Rocket Team** had a very impressive showing at the national **NASA-sponsored USLI competition** in Huntsville, Alabama.

The team's rocket slightly missed the target altitude but managed to safely recover the rocket and the scientific payload.

The team won the **Best Design award**. This was our first experience in this competition. MTSU had the only Engineering Technology team. The scientific payload consisted of a Geiger counter that measured the levels of radiation in the atmosphere throughout the flight and digitally recorded it for recovery and further analysis. **Dr. Ahad Nasab** is the faculty advisor for the Raider Rocket Team.

Environment Science and Technology (EST)



The **Tennessee Lead Elimination Program (TN LEAP)** program here at MTSU has existed since 2003. **Drs. Carol Boraiko** and **Kathy Mathis** are the principal investigators. **Faye Ralston** is the program manager, **Leigh Woodcock** (Knoxville) is the program coordinator and **Jennifer Tweedie** is the office supervisor. The goal is to make pre-1978 housing safer and healthier for the children under six who live there. Many different state, local and private agencies refer applicants to the program.

This home in Knox County where two children under six years old live had lead contamination.



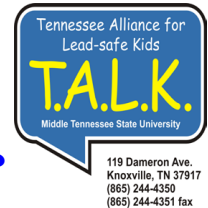
Partnering with the homeowner, TN LEAP removed and rehabilitated 13 original windows and the front entry door rather than replacing them. Then both the interior and exterior of the home were repainted with encapsulating paint wherever lead-based paint hazards were found.



Now the home looks great and the children are safe from the harmful effects of lead.

In September, **TN LEAP** was proud to host the quarterly **Childhood Lead Poisoning Prevention Program (CLPPP) advisory committee** in Murfreesboro at the Heritage Center. Twenty-two representatives from across the state attended. TN LEAP committed to providing "cleaning kits" to the Regional Health Offices whose representatives attended the December, 2010 CLPPP meeting. These kits are for distribution to their clients and include information on how to best clean if lead dust is suspected and information on TN LEAP services.

What
Is
T.A.L.K.?



The **Tennessee Alliance for Lead-safe Kids (TALK)** is a HUD funded childhood lead poisoning outreach grant that fights childhood lead poisoning by educating parents and professionals about the dangers and preventions of this serious threat.

TALK has reached over 500,000 parents and health care/child care professionals with this important message through public service announcements, first time homebuyers classes, direct mailings, and community events.

TALK partners with: **Nurses for Newborns Foundation of Tennessee** and **Tennessee Voices for Children** for childhood lead poisoning outreach to parents, child care professionals and health care professionals during home visits, parenting classes, community events, and professional events.

Construction Management (CM)

The National Association of Home Builders (NAHB) Student Chapters Advisory Board is made up of thirty construction teachers and construction industry personnel. The student organization is a part of the National Homebuilders



Association (2,000 + students). As chair for the next year Dr. David Hatfield attended the fall Board meeting held in New

York city with another CM faculty member, Duane Vanhook, who is also a member of the NAHB Advisory Board.



Second Annual CCM Golf Tournament The Commercial Construction Management (CCM) Industry Advisory Board held the Second Annual CCM Golf Tournament at



the Hermitage golf course on October 18. "Friend raising" was considered more important that fundraising. The event raised \$10,000 to support the program. They

expect the event to grow significantly over the next few years.

Sponsored by Dr. Heather Brown, Concrete Industry Management (CIM) students Daniel Cook, Trevor Harty and Andy Steffen teamed up with Construction Management students Manuel Caranza and Brady Turner and won 2nd place in the American Concrete Institute's (ACI) national construction competition which had 46 competitors. The team presented their work and received their award at the ACI convention in Chicago in March.

Concrete Industry Management (CIM)

Our innovative Concrete Industry Management (CIM) program has now grown to over 300 majors and will separate from the Engineering Technology Department on July 1, 2011. The new department will be chaired by Dr. Heather Brown who currently directs the CIM program.

MTSU's nationally recognized Concrete Industry Management (CIM) Program, which began in



L to R: Jerry Morton (MTSU), Heather Brown (MTSU), Vedaraman Sriraman (TSU), Mohamed Mahgoub (NJIT), Jiong Hu (TSU)

1996, was the first program of its kind in the country. The program was so popular with the concrete industry that three other universities were added under the CIM umbrella in 2005: California State University-Chico, Arizona State University, and the New Jersey Institute of Technology. In fall 2009 Texas State University was added to this list.

The CIM Program engages its students with the community and partnerships with industry. It has one of the highest retention rates on campus. Its graduates average higher starting salaries and, despite the economic downturn we are currently experiencing, 70% of these graduates have been employed this year. During better economic times, 100% of our graduates find jobs.

In early May, the CIM Program hosted a series of events —

- a dinner for graduating seniors,
- a meeting of the MTSU CIM Patrons and Executive Advisory Committee

- a golf tournament
- spring meeting of the CIM National Steering Committee (NSC).

The NSC consists of industry leaders from across the country. The committee meets three times each year, with the spring meeting always taking place at MTSU. The commitment of time, talent, and treasure from these wonderful industry supporters makes the CIM program the envy of every academic program in the country.

CIM Program Director Dr. Heather Brown and several students took part in the activities at Lafarge National Cement Terminal in west Nashville on June 4, Concrete Appreciation and Safety Day.

The Tennessee Concrete Association (TCA) recently won the 2010 GreenSite Award (Demonstration Category) for the



From the left, CIM majors Hunter Wallace (Sr.), Abbie Tomlinson (Sr.), and Brian Anderson (Jr.) planted a tree at the National Cement Terminal.

development of our campus in Nashville using sustainable building practices. Much of the work done in this project involved interns from the CIM program. You can see an online presentation at www.greensiteawards.com.

CIM Alumni Skeet Shoot Tournament Concrete Industry Management (CIM) held it's annual CIM Alumni Skeet Shoot Tournament on October 22. There were six teams of alumni that participated in this event.

Congratulations are in order . . .

In recognition of his professional distinction and achievements in the field of civil engineering, **Dr. Walter Boles** was recently named an American Society of Civil Engineering (ASCE) Fellow. Congratulations, on achieving one of the highest levels of ASCE membership, Dr. Boles!



The winner of the Quarterly Exemplary Employee Award was our very own Engineering Technology Executive

Aide, **Sally Swoape**. Engineering Technology Chair Dr. Walter Boles presented the award to her last September. Yea, Sally!

chapter. In two years this chapter has grown from four elected officials to over 60 members, and Daniel played an integral role in this growth. His commitment to our industry and his studies made him a perfect candidate.

J. Tyler Stokes, ET graduate student, was recognized by the Nashville chapter of the Society of Manufacturing Engineers (SME) at their scholarship awards banquet on December 7th. Tyler is just finishing his first semester as a grad student and comes to MTSU with a B.S. degree in Biology from the University of Kentucky. He works for Lightwave Solar Electric in sales and design of solar arrays, but still has time to work as the team leader of the "Raider Rocket" team that is competing in NASA's University Launch Initiative.

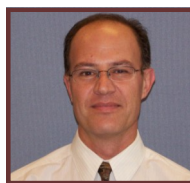
MTSU student, **Brock Downing**, has been selected as a recipient of the Benjamin A. Gilman International Scholarship in the amount of \$2,500. Brock, a Concrete Industry Management (CIM) major, will be studying in Morelia, Mexico for Summer 2010 as a participant on a KIIS (Kentucky Institute for International Studies) program.

The Gilman Scholarship Program seeks to diversify the kinds of students who study abroad and the countries and regions where they go. Specifically, the Gilman Program offers scholarships for students who have been traditionally under represented in education abroad. Brock has won an award as part of a special pilot award cycle for majors in Science, Technology, Engineering, and Mathematics (STEM) field disciplines. Only 125 scholarships will be awarded nationwide to students studying abroad during the Summer of 2010.



Dr. Saeed Foroudastan was recently the sole recipient of the Society of Automotive Engineers International (SAE) Excellence in Engineering Education "Triple E" Award. This award is presented annually in recognition of outstanding contributions made toward the advancement of engineering education and the excellent support of student activities for SAE Collegiate Design Competitions on both national and international levels. The award was presented to Dr. Foroudastan at the 2010 SAE World Congress Awards Ceremony in Detroit, MI.

Against strong competition from Vanderbilt University and Tennessee Tech, **Dr. Ahad Nasab** was able to secure the donation of a laboratory grade robot. Throughout the fall semester Dr. Nasab negotiated the donation of this robot. The robot is very powerful (programming wise) and is a true industrial, as well as research robot. When Dr. Nasab received the robot it was still in the original box and had an estimated value of \$50,000. The robotics Team and Mr. Vanhook have been accumulating information on the robot so they can create a manual for it.



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In February, **Elizabeth Lamb**, our Engineering Technology secretary earned her CPS. We appreciate her hard work. Great

job, Elizabeth!

One of our new Construction Management faculty who joined us this past August, **Alan Sparkman**, will be receiving the 2010 Tennessee Sustainability Award from the Tennessee Environmental Council for work done through the TCA. You can see the announcement at www.tectn.org



Daniel Cook, a senior at MTSU majoring in Concrete Industry-Management, was recently awarded the first annual Construction Leadership Council (the future leaders group of Associated General Contractors of TN, Middle TN Branch) scholarship. In 2010, the group established a scholarship fund for MTSU AGC Chapter members majoring in Concrete Industry. This \$1,500 annual scholarship is available to all CIM juniors and seniors. According to **Katie Bouldin of Rock City Construction, CLC's** Scholarship Chair, "This year we had an easy choice." Daniel Cook is President of the AGC student

Moving on . . .

Dr. Richard Redditt retired and ended his 44 years of loyal service to MTSU on June 30.

Dr. Redditt began his career at MTSU in 1966. He taught many different subjects within the Department of Engineering during his years on the faculty. For ten years he left the University and ran his own business in electronics design and industrial seminars.

He worked extensively during that time, travelling to Canada and much of the U.S., including the Arctic Ocean at the north end of the Alaska Pipeline during one of his three visits to Alaska. He also worked in Saudi Arabia and in Abu Dhabi in the oil fields, training engineers on the newer industrial control systems.

After his return to the university in 1986, he later was an invited professor to Wuhan University in China, in 1996, and was selected to travel to the Three Gorges Dam while under construction, and traveled up to the Little 3 Gorges area on the Yangtze River before the area was flooded when the dam was closed.

He was selected to serve the Board of Regents as university represen-



Drs. McPhee and Redditt at the Emeritus Ceremony in 2010.

tative to the Economics and Water and Energy Conference in Beijing, China. In 2004, he was selected to present his original research on Teaching/Learning at the 33rd International Symposium for IGIP/IEE/ASEE in Fribourg, Switzerland.

During his tenure at MTSU, he held several appointments, including Director of Graduate Studies for the Engineering Technology Department and Professor for the Russell Chair of Manufacturing Excellence. He also served as a member of the Board of Directors at the Nashville Technology Council representing the Tennessee Board of Regents System. He served as an external reviewer for the Master's graduate program for East Ten-

nessee State University and was selected to serve on the Board of Directors for MTSU Continuing Studies and Public Service Program.

His industrial designs include an Analog-Digital interface system which was sold to the Control Data Corporation for use in their Plato Learning Centers throughout the world. He designed the new front entrance to the Voorhies Engineering Technology Building so it could house the 8-foot digital clock designed and built by two graduate students. This clock system was originally connected to the Atomic Clock at the National Bureau of Standards in Ft. Collins, Colorado, and remains accurate to within one (1) second of standard time.

His association memberships have included American Society of Safety Engineers, American Society on Aging, Professional Speakers Association, American Vocational Association, American Industrial Arts Association, National Association of Industrial Technology, Epsilon Pi Tau, Pi Delta Kappa, and the Independent Computer Consultants

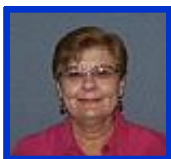
Moving up . . .

Elizabeth Lamb, our E.T. secretary for the past 3 years, not only earned her CPS certification this year, but was promoted and transferred to the office of the Dean of Basic and Applied Sciences this past June. As the Executive Aide for the College of Basic and Applied Sciences, Elizabeth now provides secretarial and clerical support to the dean of the College of Basic and



Applied Sciences, as well as to the directors of four graduate programs: M. S. in Professional Science, Ph.D in Computational Science, Ph.D in Mathematics and Science Education, and Ph.D in Molecular Biosciences. We are very proud of Elizabeth's accomplishments and wish her every success in her new position.

Moving in . . .



Pat Abogado joined Engineering Technology as the department secretary when Elizabeth transferred to her new position last June. Pat worked in the Computer Science Department office

as a secretary for 5 1/2 years. It's great having a secretary who knows MTSU!



Alan Sparkman and **Steve Bertasso** joined Concrete Industry Management and Construction Management, respectively, as faculty last August. They each bring a wealth of industry experience to the department and are

doing a great job of instructing our students and helping them make connections in industry.

