Chair’s Message

We hope you enjoy another edition of the Union University Engineering News newsletter!

We would like to keep you up to date on the latest news and information from our department. If you have any information you’d like to contribute towards a future issue, please email crowland@uu.edu

- The department went through the last ABET evaluation with excellent preparation, thanks to the cooperation and support from our alumni, engineering advisory council, and faculty.
- In the spring semester 2012, the department will oversee and operate a new facility in the Center for Continued Studies dedicated to students as their project workspace.
- Graduates continue to do extremely well professionally and post-graduate academically.

Union University Engineering sponsors the 2012 Midsouth Annual Engineering & Science Conference in Memphis (May 1)

Union University will host the 50th Annual West Tennessee Regional Science and Engineering Fair to be held on Friday, March 9th, 2012
Alumni News......

"I'm about to begin my fourth semester at Vanderbilt. My time is mostly spent working as the lead TA for Digital Logic and continuing to develop my master's thesis. I'm working with the Radiation Effects and Reliability group at Vanderbilt, and my thesis will be centered around the effects of radiation strikes that induce multiple faults in combinational logic. I hope to finish that up in this next month or so, and the rest of my semester will be spent preparing for the Ph.D. and seeing how I can continue to expand my research."

Brad Kiddie ('10)

"I started the Engineering Leadership Development Program (ELDP) at Lockheed this summer. I get to rotate through different engineering jobs in the company (electrical, software, systems, etc.), receive leadership training at yearly conferences, and finish a master's degree. I'll finish the program in 2014. Currently I'm working in FPGA design on a gov't program. It's been a good year. I also got to do two board designs, an embedded system research project, and I presented at an electronics conference for some other research work I did. More importantly, we welcomed our second child, Joshua Edmon Trautman, into the world on September 28. It's a lot of fun having two young boys at home (Benjamin is 2 yrs old now)! The Lord is very good to us!"

Will Trautman ('09)

*I am now in the New Model group (at Honda Mfg. of Indiana) as a PL over a large area. We are now working on the Acura ILX which will go into mass production this April! It is very exciting time as we are the only plant in the world that will be building this model! I am very happy to be a part of this great land mark for HMIN. On a personal note, my husband and I are building a house on the south side of Indianapolis. We are very excited to use our engineering skills during the process to help make our new house exactly the way we want it to be. Jason is taking care of the electrical and I, the mechanical."

Keri (Harwood) Wisniowski ('09)

*After I graduated, I took a job in Corinth, MS with Ayrshire Electronics as a Process Engineer. They assemble circuit boards, water meters, gas meters, and other various electronics. I left the company after being there for only seven months to pursue a more mechanically driven position. Soon after I found a company in La Vergne, TN called Parthenon Metal Works. They were looking to expand and hire some entry level engineers and I was lucky enough to make the cut. Parthenon manufactures and fabricates steel tube. I currently live in Murfreesboro, TN and work in Nashville. I am considering the MBA program at MTSU since I am so close and my company has a tuition reimbursement program. The family is doing great. My youngest just turned two and my other son will be eight in February. All in all life is good."

Sean Norton ('10)

*I am currently working at Schneider-Electric as an Application Engineer in La Vergne, Tn (in between Nashville and Murfreesboro). I've been here for five months now and am enjoying learning new things every day. I hope everybody in the engineering department is doing well. Please give everyone my best wishes and keep me up-to-date with the on-gosings within the department. Happy new years!*

Will Stewart ('11)

I'm living in Knoxville. I'm in the direct-to-PhD program at the University of Tennessee - Knoxville, and I'm working as a Teaching Assistant. I'm studying Analog Microelectronic Circuits.*

Kyle Harris ('11)

Congratulations to David Foster ('06) for passing the PE licensing exam! David is currently with Smith Sechman Reid, Inc. in Memphis, TN.
“Working as Sr. Design Engineer for ABB. Wife (Amy), sons (Ethan and Brayden). I recently led a team to Belize to build a Church/Clinic for the village of Hope Creek. We have plans to return to Belize for an additional project in the summer of 2012.”

Jon Brasher (’06)

“I am currently working at Logical Systems Inc in Jackson, TN. I will be transferring to the GA branch (near Chattanooga, TN) starting the first of the year. My wife, Amber, will finish teaching the school year at Crockett County High School before relocating.”

Josh Shrewsberry (’07)

“I am currently an Electrical Design Engineer for Chormalox, Inc. in La Vergne, TN and I love my job. I spend about 70% of my day in AutoCAD Electrical 2012 drawing electrical schematics and designing layout of components in enclosure panels. In the other 30% I have random projects that currently include a system to allow a UL Lab to test “Max Pacs” that we design to ensure they meet their standards before we market the product to customers. While my concentration was mechanical engineering, I am deeply thankful to the department for having electrical courses as part of my curriculum as well since they better prepared me to take on an unexpected career path in electrical design.

In the midst of starting my career, on September 16, Ema, Carly and I welcomed Noah Timothy into the world and he is amazing. Our goal is to buy our first home sometime this year which is a scary thought since the first five years of our marriage we lived where Union told us to.”

Tim VanCleave (’10)

The Fall 2011 Freshman Design Team and their t-shirt gun displays:

Pictured L to R: Will Embry, J. D. Doumar, Logan Mullikin, Grace Morriss

Pictured L to R: David Tanner, Audrey Hazlehurst, Robert DeLuca, Ben Withers

Faculty News…

Drs. Schwindt and Pingen will continue to partner with a non-governmental organization (NGO) doing renewable-energy (RE)/sustainable development in villages in a mountainous region of North Africa. Details are still being worked out at this time, but possibilities include evaluating and following up on last year’s work on an existing RE-based hammam (public bathhouse) and wind turbine installation, working on a new site for a RE hammam using the design of last year’s senior engineering design teams, meeting with an American-style university with a master’s program in renewable energy engineering, and conducting science lessons in elementary schools.
The Use of Steam as an Energy Source in a Piston-Driven Engine  
(James Avery, Ryan Substad, Wilson Holland, Jonathan Gwaltney)

This research project is the design and application of a steam powered engine. This project focuses on the construction of an original model for the application, along with the analysis of the energy transferred and the overall efficiency. The project is divided into two parts, the boiler apparatus and the piston model. We hope to achieve a steam driven piston, powered solely by the steam produced in the boiler, and the conservation of momentum in the flywheel. As these results are achieved, the output data is collected and a Thermodynamic analysis will be conducted in order to maximize the overall efficiency. This research, conducted in a small scale model, will show how the heat source is used to power the engine and will give results for full scale engines.

A Bright Idea: Analyzing Energy Savings from Turning off Desk Lamps in Union Offices  
(Rachel Carbonell, Caroline McConnell, Joel Ingram, Jonathan Gwaltney)

At the end of the day, the hardworking Union employee packs their briefcase, turns out the overhead light, and closes the door behind them as they direct their thoughts towards home. All this occurs without the employee noticing that they have left their desk lamp turned on, and that it will continue to shine through the night until they return the next morning. The purpose of this project is to determine if the energy consumed by desk lamps or other office lighting during the night poses a significant cost to the university. By considering variables such as administrative versus professorial offices, day of the week, and gender of the office-holder, the potential yearly energy savings for the university will be determined and presented. The group also explored and will present possible solutions to the problem of energy waste from leaving desk lamps lit through the night.

Fuel Efficiency Relative to Air Intake  
(Tom Drury, Phillip Johnson, Kian Jost, Ryan Substad)

It is speculated that hot air intake on a vehicle is more efficient than cold air intake. This project will examine the fuel efficiency of hot air intake versus cold air intake by conducting experiments. Test runs will be performed on a closed course by using different temperature air intakes. The amount of fuel used will then be calculated and the fuel efficiency will be determined. The aerodynamics of the vehicle will also be briefly examined and its relationship to the fuel efficiency of the vehicle. The results will be tabulated and the best combination for fuel efficiency will be determined.
The Aerodynamic and Heat Transfer Properties of a Solar Panel
(Eric Olson, Rob Calvert, Aaron Porterfield, John Hall, Nate Peterson)

As traditional sources of power such as fossil fuel become more difficult to obtain, alternatives such as solar power are more important than ever. While new technologies for solar cells continue to improve efficiency, more direct sunlight will allow for greater power production. To facilitate this, solar panels are often mounted on movable mounts that maximize the amount of solar radiation collected. However, the combination of a large collection area of the panel, and a space efficient support structure make the assembly vulnerable to high winds. This project examines the forces and cooling effects of wind flowing across a solar collector at various angles. This is a critical step in designing an economical system robust enough to withstand high winds.

Rocket Science
(Matt Wilson, Brady Sheppard, Scott Kahler, Wilson Holland)

The students are currently enrolled in Engineering Experimental Methods. The purpose of this class is to teach engineering students methods for properly conducting experiments and analyzing data collected.

The group will be conducting an experiment involving the distance travelled by various “bottle rockets” with differences in aerodynamics, masses, and applied pressures. The goal of the project is to determine the optimal design to maximize the distance travelled by the rockets, while using analytical methods the students have learned throughout the semester.

The poster will consist of measured data, any calculations involving this data, and various analytical approaches toward determining the best design, as well as graphs and pictures for aesthetics.

Spring 2012 Capstone Projects.

Graduating seniors will be finishing up the following three capstone projects.

1. Design a system that takes shelled cashew nuts and roasts them, seasons them and packages them so that they are ready for consumption. This process is part of a larger plan to create job opportunities for people in third world countries and use the proceeds for humanitarian aid. (Nate Peterson, Karl Magnuson, Rob Calvert, John Hall)

2. Design and build a trench-cleaning robot to facilitate the operations of Pringle plant as requested by the Diamond Foods company. (Jeff Maharrey, Rachel Quinn, Aaron Porterfield)

3. Design and build a human-powered vehicle to compete in the 2012 ASME Human-Powered Vehicle Challenge (HPVC). (Eric Olson, Jacob Hodge, Daniel Kennedy)

Much more info on these projects will be in the next engineering newsletter.
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**Engineering Advisory Council Membership:**

- **Dave Geibel** (ABB Inc.)
- **Tom King** (Birket Engineering)
- **Kelly Puckett** (Dana Corp.)
- **Jeff Haynes** (Delta Faucet Co.)
- **Bill Dement** (Dement Construction)
- **Kyle Spurgeon** (Jackson Area Chamber of Commerce)
- **George Flew** (Jackson Energy Authority)
- **Rodney Brooks** (Jarvis Caster Co.)
- **Philip Lim** (Memphis Light Gas & Water)
- **Lloyd Hansen** (Nortec Corp.)
- **Bob Campbell** (Panther Oil Co. Inc.)
- **Christina Wilson** (Stanley Black & Decker)
- **John Cole** (Tennalum)
- **Dennis Henderson** (TLM Assoc.)