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College of Engineering and Applied Sciences

InSPIRE

College of Engineering and Applied Sciences
Western Michigan University

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Welcome to InSPIRE, the new e-newsletter for the College of Engineering and Applied Sciences. Look for this monthly electronic publication the first Wednesday of the month. We want to keep you updated on all the interesting and innovative things going on in the college. You'll see stories about our students and their successes inside and outside the classroom. We will keep you informed of faculty achievements and research. And we'll be featuring one of our CEAS graduates in our Alumni Spotlight in each issue.

Story ideas? Send them to ceas-news@wmich.edu. We would love to hear from you.

Up, up and away

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Read Full Story

Students prepare to float their boat in April

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Read Full Story

Paper engineering students meet industry leaders

After traveling 2,000 miles – with seven flights, six buses and one flight delay – WMU paper engineering students returned from Portland, Maine, where they recently attended a student summit held by TAPPI, the technical association of the pulp and paper industry. The 41 students had a whirlwind trip that involved hearing from notable speakers whose topics included leadership and the importance of personal branding and networking. The also had a chance to interview with leading companies in the industry.

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State of the college presented at January meeting

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Lusanni Acosta receives scholarship

Welcome Dannielle Curtis

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Our mailing address is:
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Up, up and away

WMU engineering students sent up a high-altitude balloon carrying a camera that captured this view of Earth.

Western engineering students want to launch stuff. Lots of stuff. It's the Western Aerospace Launch Initiative and its members plan to design, build, test and launch a CubeSat into outer space. It would be southwest Michigan's first satellite.

What's a CubeSat? Picture a 10-centimeter cube – about the size of a grapefruit – with a weight of about 3 pounds. You're probably wondering what you can fit in such a small space. Plenty. A power system (think solar panels and batteries). A communication system to be able to talk with the satellite. And a payload -- in this case a camera to take photos of the Earth.

The organization is raising money to build a satellite that will be launched by NASA and orbit the Earth. The satellite will take photos using a control system that allows them to point the satellite at specific locations and share photos. CubeSats can be sent into orbit in one of two ways. NASA will allow them to hitch a ride on a large launch vehicle when they have extra room. Or they can be transported in a resupply mission to the International Space Station and then launched from there on a NanoRack -- essentially a T-shirt cannon that ejects the satellite into space.

CubeSats typically burn up in the atmosphere in about five to 12 months in orbit.

"We are excited about the possibility of launching southwest Michigan's first satellite," said Nagual Simmons, a senior from Kalamazoo and vice president of the Western Aerospace Launch Initiative.

He said the student organization is open to new members. "It takes multiple disciplines to build a satellite," he said. Students involved represent computer engineering, computer science, mechanical engineering and aerospace engineering.

"It's a long-term project so there's still time to get involved," Simmons said. He said it likely will take more than a year until launch. The project also has a hefty price tag. Students need to raise about $100,000 for the sophisticated equipment. The group recently kicked off a fundraising campaign seeking individual donors, local businesses and corporate sponsors to help with the costs.

In the meantime, students will be launching high-altitude balloons and model rockets to test components and

materials.

They also will be visiting local area elementary and middle schools, presenting workshops to young students about CubeSats. "We may even launch a high-altitude balloon with small payloads the children can build themselves," Simmons said.

Dr. Kristina Lemmer, assistant professor of aerospace engineering and one of the student organization's advisors, said WMU engineering students recently sent up a high altitude balloon 120,000 feet into the atmosphere. They also recently launched one over the Kalamazoo area -- complete with camera and GPS – and were able to take photos from high above. The GPS also allowed them to find the camera in a forest near Coldwater, Mich., and reclaim it.

At least one more balloon launch will take place this semester, Lemmer said. "This balloon should ascend to an altitude of about 30,000 feet where it will travel across the state before the helium is let out and it comes down to Earth."

The CubeSat program was started in 2002 as a collaboration between California Polytechnic State University and Stanford University's Space Development Laboratory. It began as an inexpensive way for university students to learn about space systems in a hands-on way.

To learn more about making a tax-deductible donation to the Western University Launch Initiative, go to mywmu.com/WALI.

Students prepare to float their boat in April

WMU's 2015-2016 concrete canoe team

Engineering students spent a sunny Saturday recently casting their concrete canoe for an upcoming competition sponsored by the American Society of Civil Engineers. After designing, building, 28 days of curing -- and paddling practice -- the team will head to East Lansing with their canoe and see if they can float their boat.

Scheduled for April 7-9 in East Lansing and hosted by Michigan State University, the event includes multiple races including men's sprint, women's sprint, men's endurance and women's endurance (each with two paddlers) and a coed sprint with a four-person crew. Up to 11 schools from Michigan and several surrounding states will participate.

While the college has participated in ASCE's North Central Regional Conference for many years, this is the first time in a number of years that the team designed a canoe using a "female" mold rather than a "male" mold. That means that the troweling of the concrete occurred on the inside of the Styrofoam mold, rather than the outside.

"It's just different," said team captain Bryan McDowell, a civil engineering senior from St. Clair, MI. "I wouldn't say it's more difficult, it's just a completely different process than we're used to."

It's also a new design, he said. "We are taking some risks because we really want to win." The WMU team took third place overall last year.

Team members will practice their paddling technique at WMU's natatorium before the competition.

This year's entry, named the "Italian Stallion" will be judged not just on its performance on the water, but also in categories such as hull design and aesthetics. The competition also includes a display and a technical paper on the canoe project management, development and testing.

Cody Cantu, president of the student chapter of ASCE and a civil engineering senior from Rockford, MI., said he felt the casting process went well.

"I'm impressed at how well it came together with a new mold and with a younger, less experienced team," he said.

He also thanked the many donors that support WMU's student chapter of ASCE. In the concrete canoe project alone, donors have provided expertise and the use of equipment as well as in-kind and cash donations totaling more than $2,500.

Faculty advisor for the student ASCE chapter is Dr. Osama Abudayyeh, chair of the civil and construction engineering department. Advisors for the team are Dr. Upul Attanayake and Dr. Xiaoyun Shao, also from civil and construction engineering.

Said Abudayyeh, "The concrete canoe competition is a great way for students to be challenged and learn from each other outside the classroom. They gain practical experience while developing leadership and project management skills." He said it is not unusual for alumni to return to provide guidance and help on casting day.

"The students involved really develop a bond working so closely together," Abudayyeh said. "They are looking forward to showcasing their canoe and competing in April."

WMU has participated in the concrete canoe competition since 2004. For more information about the concrete canoe team, visit their Facebook page.

Paper engineering students meet industry leaders

Paper engineering students involved in the TAPPI student organization on their visit to Maine.

After traveling 2,000 miles – with seven flights, six buses and one flight delay – WMU paper engineering students returned from Portland, Maine, where they recently attended a student summit held by TAPPI, the technical association of the pulp and paper industry. The 41 students had a whirlwind trip that involved hearing from notable speakers whose topics included leadership and the importance of personal branding and networking. They also had a chance to interview with leading companies in the industry.

The eventful weekend wrapped up with a trip to Somerset, Maine, to tour a 2,500-acre mill owned by pulp and paper company Sappi, and which housed three paper machines producing coated paper, grease-proof packaging and bleached chemical pulp.

"It was a great chance to hear from industry leaders," said sophomore Rielle Walker "The information they shared really emphasized the need to develop strong interviewing, networking and communication skills with peers and potential employers."

Lance McCauley, president of the WMU paper engineering student organization Ts'ai Lun, attended an invitation-only president's luncheon held by Larry Montague, president and CEO of TAPPI. Senior Jake Marshall was part of a panel discussion on how to get the most out of summer internships and shared his work experiences with global chemical producer Kemira.

The largest number of Western students to attend this annual event, the participants also braved harsh weather and explored the city of Portland and attended a Portland Pirates professional hockey game.

Students also participated in an engineering competition that involved safely sending a raw egg down a ramp of increasing angles using only a piece of cardboard, sticky labels, tissues, a Dixie cup, a small Ziploc bag, and four wheels. With a lot of brain power and a bit of luck, Western students Evan Ericson, Matthew Muhs and Nathan Rozegnal were a part of the winning engineering team.

Computer science students capture the flag

Remember playing capture the flag as a kid? Running around on summer evenings with friends from the neighborhood trying to grab the enemy team's hidden flag and bring it back to your side?

You may be surprised to learn that our computer science students are playing capture the flag, too – only attacking and defending on their laptops.

WMU's computer science department now is offering a "Capture the Flag" course – designed to grow interest in regional and national student computer security competitions. The one credit hour course, CS5950, is an introduction to the information security competition and teaches the basic rules of the game.

"These competitions help students develop the skills necessary to defend computer systems," said Dr. Steve Carr, chair of the Department of Computer Science. "The events directly translate into job skills."

He said with the critical need for computer security experts, the course will help students take the foundations in computer science they learn in the classroom and apply those skills in a practical setting.

"Our goal in the College of Engineering and Applied Sciences is for our students to be career-ready when they graduate," he said. "Capture the Flag is one course that helps us achieve that goal."

The three common types of capture the flag competitions include jeopardy, attack-defense and mixed. Jeopardy-style competitions involve a series of tasks in categories such as forensics, cryptography, web and binary exploitation. Teams gain points for every task they solve, with more difficult tasks receiving more points. In order to go on to the next task, the team must complete the previous task.

With the attack-defense competitions, each team has its own network with vulnerable services. The team has time for patching the services and developing binary exploitation. The organizer of the game then connects all of the participants and competition begins. Each team protects its own services for defense points and hacks opponents for attack points. Mixed competitions vary in formats and can include both types of competitions in one.

“These are very strategic competitions and we have to carefully plan our modes of attack,” said Colin MacCreery, a master’s student from Battle Creek who is team captain and vice president of the Computer Club at WMU. “In these contests, you are always going to learn about something you don’t know, and the competitions will challenge you.”

Most recently the WMU team competed in a jeopardy-style competition placing 77 out of 245 teams from around the world. It is ranked 140 among all registered teams globally.

State of the college presented at January meeting

CEAS faculty and staff recently received an update on the state of the college at the first "All-Hands Meeting" of the year. Dean Toutanji provided an overview of enrollment, research spending and faculty and staff accomplishments. Among the highlights:

- Undergraduate enrollment in the college is at 2,183 – up 2.8 percent over spring 2015. Master's degree enrollment is down 6.1 percent from last spring with 463 students. The doctoral program has grown 6.8 percent and now has 141 students.
- During the 2014-15 academic year, 313 undergraduates were awarded degrees. In addition, 151 master's degree students and 10 doctoral students received degrees.
- Research grants for the fiscal year 2014-15 totaled almost $3.9 million, a significant increase over the previous year.

The mechanical and aerospace engineering department continues to draw the most students, but there were also slight increases in chemical and paper engineering, computer science and the electrical and computer engineering departments.

"We should be pleased at the overall stability of our college," Toutanji said. "The growth and interest in our doctoral program across disciplines is very positive as well." Also noteworthy, he said, was the establishment of 2 + 2 agreements with the University of Shanghai for Science and Technology, allowing easy transfer of credits between the two schools.

He said faculty and staff will be busy preparing for ABET accreditation in 2017-2018 with a mock visit scheduled this year. And a mechanical and aerospace engineering committee is developing university guidelines for drones and unmanned vehicles.

Other recent activities and initiatives included the hiring of two new faculty members in computer science, the renovation of the college's auto lab as well as the renovation of Kohrman Hall for faculty offices. The college's website also is migrating to a new format.

In addition, a new CEAS Graduate Student Council and CEAS Graduate Council were formed.

During the meeting, Toutanji recognized a number of faculty, staff and students. Those receiving faculty/staff awards included:

Outstanding New Educator
Dr. Jim Springstead
Chemical and Paper Engineering

Outstanding New Researcher
Dr. Fahad Saeed
Electrical and Computer Engineering

Outstanding Researcher
Dr. Zijiang (James) Yang
Computer Science

Outstanding Staff
Tamara Bergman
Dean's Office

Other faculty recognized for recent accomplishments were:

Dr. Massood Atashbar
Electrical and Computer Engineering

Dr. Tycho Fredericks
Industrial and Entrepreneurial Engineering and Engineering Management

Dr. Pablo Gomez
Electrical and Computer Engineering

Dr. Margaret Joyce
Chemical and Paper Engineering

Dr. Jiansong Zhang
Civil and Construction Engineering

The following students also were recognized for recent achievements:

Sai Guruva Reddy Avuthu, Department of Electrical and Computer Engineering, Student Best Paper award, Chemical Sensors Track at IEEE Sensors 2015 Conference

Richard Atta Boateng, Department of Civil Engineering, first place Student Paper Competition, Institute of Transportation Engineers Great Lakes District

Amer Abdulmahdi Chlaihawi, Department of Electrical and Computer Engineering, awarded $900 graduate student research grant

Dinesh Maddipati, Department of Electrical and Computer Engineering, awarded $900 graduate student research grant

CEAS faculty recognized for research successes

Faculty from the College of Engineering and Applied Sciences were among those honored at an Excellence in Discovery luncheon held February 5 and hosted by WMU President John M. Dunn and Provost Timothy J. Greene.

The event celebrated the success of numerous faculty and staff members in obtaining external research dollars. During the event, Dr. Daniel M. Litynski, vice president for research, recognized WMU faculty for bringing in external research funding.

Four principal investigators and five co-principal investigators from the College of Engineering and Applied Sciences were singled out for their outstanding work and for bringing in more than $1 million each in external funding awards each year during the past five years.

Those faculty members recognized were:

Principal Investigators

- William Liou, CAVIDS Center, Mechanical and Aerospace Engineering
- Jun-Seok Oh, Civil and Construction Engineering
- John Patten, Industrial and Entrepreneurial Engineering and Engineering Management
- Edmund Tsang, College of Engineering and Applied Sciences

Co-Principal Investigators

- Osama Abudayyeh, Civil and Construction Engineering
- Shiva Om Bade Shrestha, Mechanical and Aerospace Engineering
- Claudia Fajardo-Hansford, Mechanical and Aerospace Engineering
- Valerian Kwigizile, Civil and Construction Engineering
- Koorosh Naghshineh, Mechanical and Aerospace Engineering

Lusanni Acosta receives scholarship from Institute of Transportation Engineers

Lusanni Acosta, a graduate student in transportation engineering, was one of four winners of a $3,000 scholarship from the Michigan section of the Institute of Transportation Engineers. Scholarships were for both undergraduate and graduate students. Applicants had to submit a paper titled “My Future in Transportation,” describing their goals in the transportation field as well as their potential contributions to the area.

When asked what winning the scholarship meant to her Acosta said, “I am very proud of the academic institution I attend, Western Michigan University, and it is an honor to represent it with this award. For me this scholarship not only helps in alleviating my academic expenses but in confirming, strengthening and building more confidently my path in transportation engineering.”

The Institute’s education-scholarship committee chairman, Tim Haagsma, contacted Michigan chapter advisors about the scholarships. Dr. Jun-Seok Oh from Western Michigan University’s civil and construction engineering department is a chapter advisor and shared the information about the scholarships with transportation engineering students. The scholarship program started in 1989.

Lusanni Acosta, center, is pictured with the 2015 Michigan Section Executive Board

Welcome Dannielle Curtis

Dannielle Curtis recently joined CEAS Advising and is working with students in electrical and computer engineering, as well as engineering management technology.

She is the advisor for 350 students and tries to meet with students in her programs each semester. “Every student is in a different position, faces various scenarios and is comfortable with varying course loads,” she said. “My job is help them successfully navigate the challenges of their programs.”

Curtis said she is enjoying getting to know her students and learning the complexities of her role as an advisor.

“From when they start to when they graduate, I’ll be on the journey with them,” she said. “There’s so much more to the college years than what happens in the classroom.”

Curtis previously worked in the registrar’s office. She received both her bachelor’s and master’s degrees from WMU, and hopes to start a Ph.D. program in the near future. One of 11 children and a first-generation college graduate, her favorite pastimes are traveling, swimming and reading.

Alumni Spotlight: Kevin Khaw

Meet Kevin Khaw, M.S. Engineering Management ’05 and B.S. Computer Engineering ’02. Khaw loves building web applications and tinkering with embedded systems. He’s worked at Google for the last nine years and currently manages a team in Google’s cloud computing group.

What’s your career path been like? What opportunities and decisions led to your current position at Google?

Growing up in Malaysia, I was fortunate enough to be surrounded by technology at an early age. The whole concept of the Internet fascinated me. I was determined to be part of a movement that promotes the democratization of information and ease of communication around the world.

As a WMU engineering student, I worked as both a computer repair technician and a local area network technician. After graduation, I helped manage technology and operations of the computer aided engineering lab right before the grand opening of the Parkview campus.

After graduating, I packed my bags and headed to California without a job waiting for me. I founded two startups which I call “nonprofits” because I made no profits! I also worked for a small financial software company before ending up at Google.

What are you passionate about in your work?

Feeling empowered to make a difference, solve difficult problems, and learn from the best and brightest in every field. Google’s mission is clear and simple. “Organize the world’s information and make it universally accessible and useful”. It captures the essence of Google’s culture to constantly innovate and push technological boundaries. Cloud computing is poised to change information technology as we know it and I’m happy to be part of the next wave of technological innovation on the internet.

We hear a lot about the culture at Google. What’s it like firsthand?

Everything is true! Well… most of it. Walk around Googleplex and you’d likely feel more a college vibe than working at a large corporation. Definitely a great place to be if you are an engineer. I’m mostly here for the opportunity to work on stuff that touches billions of people -- but it is hard to not take note of the amazing company benefits. Free food at first-class cafes, gyms, laundry rooms, massage rooms, haircuts, car washes, dry cleaning, commuting shuttles, bowling alleys, nap pods, talks by authors and celebrities, climbing walls -- just about anything an employee might want. Google goes out of its way to take care of its employees and I’m very thankful to be part of this great company for the last nine years.

How did your experience at WMU’s College of Engineering and Applied Sciences shape your success?

It provided me with a great foundation and opportunity to pursue my dreams. Many of my professors played a huge role in my life and I still remember them like it was yesterday. Dr. Lyth, Dr. Mallak, Dr. White, Dr. Kaminski, Dr. Kerstetter, Dr. Trenary, Dr. Bafna, Dr. Houshyar, Dr. Grantner, Dr. Bazuin, Dr. Abdel-Qader,

Dr. Asumadu, Dr. Atashbar, Dr. Johnson, and Dr. Severance (my amazing senior project advisor) to name a few.

As a student, I constantly tried to help improve courses I attended. Everything from suggestions on how to improve the syllabus, to writing new course materials, and even filling in for Dr. Gartner's ECE 3500 labs and classes when he was on sabbatical. Students, don't wait for your lectures or next course. You are equally as responsible for your education and the Internet is a great place to expand that knowledge.

Moving from Kohrman Hall to Parkview Campus was equally fun. I visited the Parkview Campus several times during the construction phase and spent most my time planning the technology roll-out there. The experience of managing a team and technology at Parkview as a graduate student gave me the confidence that I could do anything if I put my mind to it.

What do you remember most vividly about your time as a Bronco engineering student?

Where do I start?! Adapting to the weather and U.S. culturally was fun and interesting at the same time. I had lots of great mentors, met a lot of wonderful people along the way, and formed amazing friendships over the years. Many of them I still keep in touch with after all these years.

I was fortunate enough to meet many staff, faculty and students across WMU when I was working at the Office of Information Technology. It opened up my eyes to people of different backgrounds and experiences. We take diversity very seriously at Google and being exposed to so much diversity growing up helped me view the world very differently.

One moment I'll never forget was a day in the fall when I bumped into the late Dr. Floyd near the library. He stopped and asked me what I was doing with all the computer equipment. At first, I was a little lost for words when the president took time to ask me about my day. We chatted for a few minutes and he thanked me for helping keep the university's computers going before heading off to his meeting. He taught me to be humble and to respect everyone around you regardless of background and who they are. A great university president who will be missed.

I haven't been back to Kalamazoo since 2005 and hope to be back one day.

What's the most incredible thing that's happened to you since graduating?

My lovely family and the opportunity to work at Google. Aside from that, the opportunity to give back to WMU. I strongly believe that we (staff, faculty, students and alumni) should band together to make WMU a better university. I'd love for us to have an even stronger alumni network with better connections to students. If you are interested in engineering management, you'll find me in ME 6000 where I video conference about my experiences and managing a team at Google.

What is something people don't know about you?

I was an extra on "The Internship" but my scenes never made it to the movie. Looks like I'll have to stick to being an engineer for a couple more years.

You can reach Kevin Khaw at: www.linkedin.com/in/kevinkhaw or kevinkhaw@gmail.com