

# ENGINEERING & TECHNOLOGY TIMES

FALL 2017

News and Notes from the College of Engineering and Technology

Dedicated to Student Success, Regional Transformation and Public Service

## College Collaboration Means Quality of Life to Patient

If you were to ask Dr. Ranjeet Agarwala, assistant professor with ECU's College of Engineering and Technology, the dream of having his college collaborate with ECU's Brody School of Medicine, and the Joyner Library started when his daughter was 2 years old. At that time in 2014, his daughter needed a thoracic procedure. During that process, Dr. Agarwala began to see the role 3D printing could play in the health field.

"I knew ECU had the infrastructure to use this innovation to have an amazing impact in the future," said Agarwala, who has expertise in computer-aided design.

In March 2017, Agarwala's opportunity to merge innovation and patient care presented itself.

Dr. Carlos Anciano, thoracic surgeon and ECU assistant professor, and Dr. Preston Sparks, ECU cardiothoracic surgery fellow, met Franklin Arnold of Goldsboro.

Born with a twisted spine, Arnold had prior corrective surgeries which caused a deformity in his chest. Ribs were removed. Calcium deposits grew. This caused what Arnold described as traumatic pain that impaired his daily functions, forced him to wear a brace for two years, and started to take away his breath.

"I kept telling everybody I'm having major pain here," said Arnold. "I was on a lot of pain medicine."

Arnold was referred to Anciano and Sparks from his pain management physician Dr. Juan Firnhaber of Greenville.

### Collaboration using 3D printing

After meeting with Arnold, Anciano and Sparks discussed treatment options. Sparks, who is on active military duty and completing his surgery fellowship at ECU and Vidant Medical Center, said he was not used to seeing this kind of chest wall trauma in Greenville. It resembled traumatic injuries accustomed to battlefields and wartime.



Photos courtesy of Cliff Hollis, ECU News Services

"I was in Dr. Anciano's clinic when we saw Franklin come in initially," said Sparks. "We (Sparks and Anciano) sat down between cases one day, and he said he had this idea."

That idea was to introduce 3D technology into Arnold's treatment plan.

Hoping to make this idea happen and knowing about ECU's 3D capabilities, Sparks reached out to Agarwala, who responded quickly.

With MRI files in hand, Sparks met with Agarwala and College of Engineering and Technology graduate student Joshua Bruce Stevens.

"He was the ideal student (to work on this project)," said Agarwala.

Stevens initially collaborated with Sparks to make sure the files were correct and worked well with the software. Knowing the Joyner Library had the ideal printer to create such a large file, Stevens, aided by Dan Zuberbieber, education & instructional technology librarian with ECU's Joyner Library, printed a life-size 3D model of Arnold's rib cage.

"(The 3D model) showed us the original disfiguring that came about from Franklin's twisted spine," said Anciano. "It also showed the way he healed from previous corrections to his curvature."

### Preparation made easier

Knowing the approach for surgical intervention would be difficult, Anciano used the 3D model to develop his plan for surgery. It provided a topographical map of the chest allowing Anciano to prepare how to rebuild the patient's chest wall with a titanium mesh.

The surgery was completed on March 22; it took nine hours.

"This is the first time we married 3D printing and computer-animated modeling with an intention to treat," said Anciano.

"Dr. Sparks got me up out of bed two days later, and I was able to walk," said Arnold. "I immediately realized my breathing; it was a whole lot better. Talk about taking walks with my wife and child; I can do that

now. Yes, I still have issues, but I know without a doubt, it's helped a lot."

"It is like Christmas time"

Joshua Bruce Stevens meeting Franklin Arnold for the first time

When Stevens got the chance recently to meet the patient whose rib cage he 3D printed months before, he described it in four simple words: "It is like Christmas time."

"He (Arnold) was able to get something wonderful out of it, and I was able to get something out of it too," Stevens said.

Now, Arnold is waking up every morning swinging for the fences. He says his wife introduced him to the term "quality of life."

"I didn't understand it before, but I do now."

He also understands the importance of childhood scoliosis screening and early intervention. He's lived with scoliosis and its effects his entire life. It's Arnold's hope that others, too, will understand the importance of screening, as well.

SPONSORED BY

**Gregory Poole**



## Researching Alzheimer's

A faster and non-invasive way to identify dementia in senior citizens just might come out of Goldsboro, North Carolina through a collaboration between ECU researchers.

ECU's College of Engineering and Technology, with assistance from ECU's College of Nursing, is currently studying whether a proposed technology platform can help doctors pinpoint whether a patient has mild cognitive impairment (MCI) that can lead to dementia and Alzheimer's. The platform uses existing open-source software and electroencephalogram (EEG) testing to capture the brainwaves of research subjects who either have Alzheimer's (or dementia) or who don't show symptoms.

Using a skull cap with 16 electrodes which detect brainwave signals that are fed into a computer for further analysis, researchers can administer a visual test to see how fast and strong a patient's preconscious reaction is to seeing a familiar human face, an unfamiliar human face and a watch face.

Dr. Sunghan Kim, assistant professor of engineering, is the lead investigator of the research. He's hoping the data collected will show the recognition discrepancies that could ultimately lead to early detection capabilities, such as the platform he's currently testing.

"We want to compare the brain's response to the familiar face versus a watch face," said Kim. "Later, I can analyze the data and see what part of the brain is functioning or not functioning, based on the placement of the electrodes."

According to the Alzheimer's

Association website, the number of Americans living with Alzheimer's disease is rapidly increasing. An estimated 5.5 million Americans of all ages have Alzheimer's disease. One in 10 people over 65 suffer from it. Plus, approximately 200,000 individuals are under the age of 65 and have younger-onset Alzheimer's.

For the state of North Carolina, the number of citizens diagnosed with Alzheimer's is expected to grow more than 31 percent between 2017 and 2025.

### Getting Ahead of the Numbers

Current Alzheimer's testing relies on two methods: the Montreal Cognitive Assessment test, which is a standard questionnaire to assess various aspects of cognitive functions, and an MRI, which can help with diagnosis. These tools confirm whether or not a patient has Alzheimer's or dementia.

One of the goals of this new platform, once out of the research phase, is to give physicians a new tool to help them diagnose or confirm the disease more quickly. According to Kim, having this capability will allow patients to begin treatment to stave off the illness and will help their families prepare for the inevitable.

Rubi Merino is a nurse with the College of Nursing. Thanks to a grant, she's currently working on a geriatric program at the Goshen Medical Center in Goldsboro. It's this program that's allowing Kim and his team to conduct its research.

Merino currently recruits and screens patients who are 55 years of age or older to see if they would be ideal candidates for Dr. Kim's testing. She thinks Kim's research could be of great benefit to physicians - and their patients - who live in rural communities.

"Usually primary care providers in rural North Carolina, rural areas are not properly trained to ... diagnose them (patients with Alzheimer's or dementia),"



Dr. Sunghan Kim, right, with the aid of graduate assistant Austin White, center, researches a new way to spot Alzheimer's (or dementia) early (Photos by Rich Klindworth)

said Merino. "What happens is this person has to be referred out to a neurologist who will do a series of tests, which takes a few appointments with the neurologist before saying 'you're diagnosed with Alzheimer's.'"

"College of Nursing's role in this research is critical," said Kim. "I have a device to record brainwaves, and they have a grant and human power (nurses and staff) to reach out and recruit people who may or may not have MCI."

ECU graduate student Austin White is also assisting with Kim's research. White is a recent ECU biomedical engineering undergraduate who is pursuing his master's in the same discipline. His great grandmother was diagnosed with Alzheimer's at the age of 80. She eventually died at 95.

"I do remember it," White said. "The disease progressed to the very late stages."

### What's Next?

To date, Kim has captured data from 20 subjects. The goal is to have 120 subjects participating in the research, which he says should be complete within two years.

"Once I get to 120, I can make a statistically meaningful conclusion on the brainwave difference between MCI and healthy patients," said Kim.

Then, he added, the data set will be used to develop a diagnostic tool that utilizes advanced machine-learning techniques.

"Ultimately, this system can be deployed to rural medical centers."



## New Dean Named for ECU College of Engineering and Technology



Harry Ploehn

The College is very pleased to announce Dr. Harry J. Ploehn as its new dean. He was approved by the ECU Board of Trustees during a June 2 special meeting. He comes to the college from the University of South Carolina where he was a professor of chemical engineering and associate dean for faculty affairs and Strategic initiatives in the College of Engineering and Computing.

Please help us in welcoming Dr. Ploehn to the University and College family!

## Message from the Dean

Hello! I'm Harry Ploehn, Dean of the College of Engineering & Technology at East Carolina University. On behalf of the faculty and staff of the College, I'd like to welcome you to what I think is the best engineering or technology college in North Carolina. Our Departments of Construction Management, Computer Science, Engineering, and Technology Systems, together with our Student Success Center and research centers, have three priorities: Maximizing Student Success, Enhancing Academic Excellence, and Advancing Research and Scholarship for your benefit and for the people of this state and our nation.

What does that mean for you? Maximizing Student Success means that we will do everything that we can to help you succeed at ECU. Our Student Success Center will help you

- transition into college,
- find the right major,
- stay on track in your degree program,
- point you towards co-op, internship, research, and study abroad opportunities to enrich your academic experience,
- and finally - help you find that dream job that launches you in your professional career.

Enhancing Academic Excellence means that you will experience degree programs, classroom instruction, hands-on lab courses, and personal attention from faculty unlike anywhere in North Carolina. Our "points of pride" include a tradition of teaching excellence, small class sizes, personal attention from faculty, and degree programs that give you practical, hands-on experience that complements fundamental theory.

And you will get to know your professors inside and outside the classroom - they will know you by name and care about the quality of your education. We are investing time and energy in cutting-edge teaching technology - like providing cloud-based mini-lectures that you can watch on your phone anywhere, any time - so that you'll spend valuable classroom and lab time working on

problems with your teammates, asking the professor questions, and really learning by doing.

But we do more than just teach. ECU and the College aspire to Advancing Research and Scholarship for your benefit - our students, our industry partners, and our community. If you are a student, you will work with industry or agency partners on capstone design projects in every degree program. For our industry and community partners, you will find new ideas, expertise, and energy to help you solve problems and explore new opportunities. Our students and faculty are eager to help you! The Center for Innovation in Technology and Engineering, the Center for Sustainability, or any of our department chairs can help you find the student and faculty collaborators that are right for you. And of course, we want you to get to know - and hire - our students! They are our greatest ambassadors.

You can tell that I'm excited about the future of the College of Engineering and Technology at ECU. That's why I moved here after 27 years at Texas A&M and the University of South Carolina - because I see a great opportunity for investment of my most precious resources - my time and energy - to help the college and ECU achieve our aspirations for student success, academic excellence, and advancing research and scholarship. ECU aspires to be America's next great national university, and the College of Engineering & Technology will help lead the way.

With your help, we will work together to capture our horizon! Because that's what Pirates do!

I hope to see you here soon. Welcome aboard!



*Harry Ploehn, Dean  
College of Engineering  
and Technology*

## Construction Management Participates in Construction Career Days

The 2017 Pitt County Construction Career Days event was recently at the Pitt County Fairgrounds. The College's Department of Construction Management was one of the sponsors for the 2017 event. Forty ECU construction management students served as volunteers helping with the two-day event.

Approximately 1,000 high school students from Pitt and 14 surrounding counties visited construction exhibitors to learn about opportunities in the construction sector. In addition, students got "hands-on" experience with construction equipment. Students operated backhoes, loaders, lifts, and other equipment with the



help of professional operators.

The Bureau of Labor Statistics' Occupational Outlook Handbook states: "Employment of construction and extraction occupations is projected to grow 10 percent from 2014 to 2024, faster

than the average for all occupations, increasing from 6.5 million jobs to 7.2 million jobs. Overall growth in the economy and population will increase demand for new buildings, roads and other structures, which will create new job openings for construction and extraction occupations."

In a June 2017 blog post about the Department gaining reaccreditation,

Dr. Syed Ahmed, department chair, discussed how the construction industry is rebounding.

"(It) needs more students like our department is producing," says Ahmed. "Our employment levels are excellent."

# College Wins Historic \$2 Million Grant for Computer Science

The College of Engineering and Technology has been awarded a \$2 million grant from the National Science Foundation (NSF) to research new ways to teach computer science and to improve graduation and retention rates within the discipline.

The five-year grant, awarded to the College's Department of Computer Science, is the largest total ever awarded to the college. Dr. Venkat Gudivada, chair of the Department of Computer Science, is the principal investigator.

The award allows the department to research curricular innovations, faculty development and diversity in student learning. Results will be widely disseminated to other universities that are looking to update how they educate students in computer science and other related disciplines.

Data gathered by Code.org shows North Carolina has 18,623 open computing jobs, which is 4.5 times the average demand rate in the state. However, North Carolina had only 1,284 computer science graduates in 2015. According to Gudivada, it's imperative to find unique and innovative ways to keep students energized and engaged in the discipline.

Finding a revolutionary approach to computer science education, he said, is the



Researching new ways to teach computer science is one of the goals of a \$2 million grant awarded to ECU and the Department of Computer Science. (Photo by Cliff Hollis)

project's main goal.

"We must move beyond the current programming-centric approach to computer science education to one that is systems-centric and rooted in rigorous engineering principles," Gudivada said. "Our results will provide insight to help increase student educational attainment and academic success."

"I thank the NSF for their belief and trust in this project," said Dr. David White, interim dean of the College of Engineering and Technology. "Dr. Gudivada has assembled a stellar team whose results will help academia meet the national and global demand for computer scientists and software engineers."

Specific goals of the project include:

- Working with community colleges and early college, North Carolina high schools to recruit more underrepresented students and increase the number of transfer students.
- Using free and open-source software to provide a real-life teaching and learning environment and transforming

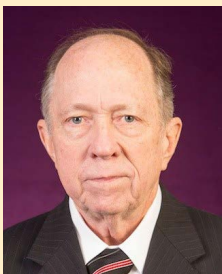
the traditional computer science education approach to a software engineering-centric approach.

- Interspersing professional skills development in the curriculum via team projects, internship and co-op opportunities, undergraduate research, entrepreneurship and professional networking.
- Personalizing teaching and learning inside and outside the classroom.
- Providing a motivating and welcoming academic environment, proactive student advising and degree planning and positive faculty-student relationships.

"Research shows that half of all STEM jobs will be in computing by 2020," said Gudivada. "Advances in the cloud and mobile computing, web technologies, big data, artificial intelligence and machine learning will make it imperative that we produce software engineers who can leverage these technologies to solve global and societal problems."

Co-principal investigators for the grant are ECU faculty members Dr. Junhua Ding and Dr. Qin Ding in the Department of Computer Science and Dr. Marjorie Ringler and Dr. William Sugar in the College of Education.

## Saying Goodbye to Two College Pioneers



Dr. Barry DuVall



Dr. David R. Hills

We are sad to announce the passing of two pioneers in the College of Engineering and Technology. Dr. Barry DuVall, who passed away on May 20, and Dr. David Hills, who passed away on June 6, were professors in the College's Department of Technology Systems. Importantly, both were instrumental in developing online programs at ECU and within the college.

We are forever grateful for their contributions and legacies. Our condolences are extended to their families and friends.

## College to Help Business with New, Innovative Environment

ECU's College of Business has received a \$2 million commitment from Van and Jennifer Isley of Raleigh that will provide opportunities for business, engineering, technology and arts students to have "creative collisions" that produce innovation and entrepreneurship.

The College of Engineering and Technology (CET) will play a major role in these creative collisions. And,

CET Dean Harry Ploehn gives insight into that role and its possibilities.

"We want to help engineering, computing and technology students see how design innovation leads to entrepreneurial opportunity," he says. "Creative collisions with business students will facilitate that and prepare them to bridge the technology and business worlds after graduation."

## Looking Back: Giving Advice to My Freshman Self

By Jill DeFranco,  
Senior, Industrial Distribution and Logistics

You pack up the family car to the brim, and the car starts to get further and further away from the town you called home for 18 years. You feel an indescribable feeling of a mixture of bliss and pure terror. You're off to begin your freshman year of college; the next four years that are supposed to determine the course of your life.

A little over three years ago that was me. I grew up in a small town outside of Cleveland, Ohio, nicknamed "The Bainbridge Bubble" because most people do not stray far, and nothing bad really occurs there.

So there I was, 10 hours away from the place I called home, and I did not know a soul. And now here I am, president of a sorority, president of an organization on campus, involved in the community, and with a plethora of friends that the thought of leaving this place in May breaks my heart.

I think a huge part of why I have become involved is because I had to. I would not be where I am or who I am today without the people that I have met over the past few years; the individuals who have pushed me to succeed and picked me up when I have fallen. One of my wonderful Phi Mu advisers once told me,



Jill DeFranco (Freshman year)

"You may fall, but you will not fail." That truly resonated with me. In the end, it is not about your downfalls, whether it be a bad grade on a test, a horrible job interview, or when nothing in life seems to be going your way. It is, however, about how you pick yourself up and grow from your mistakes to do better next time by never giving up.

My major is not the most glamorous, and there are usually a maximum of three girls in any of my classes, but I love it. The Industrial Distribution and Logistics program is unlike any other program at East Carolina University. Not only is my job outlook seeming marvelous (as I leave my senior denial to attend job interviews), I have also gained so much more than classmates. I have gained a family. I have two brothers back in Ohio, but I have a handful of brothers here. Whether it's helping me on

my homework, giving me a pep talk about boys, or even killing a cockroach in my apartment, I always have someone. It is bittersweet when one of my friends graduates, but I am excited for them in the real world, and I know that we will keep in touch.

There are not enough words in the dictionary to describe how grateful I am for my professors and anyone who has helped me along the way. I have had the opportunity to go to several conferences, one of which was in Ponte Verde, Florida, and it was



Jill DeFranco (2017)

called the National Association of Electrical Distributors Women in Industry Forum (try to say that five times fast). It was cool to see that there are a lot of women out there in the industry, and I actually ended up getting an internship at Mayer Electric this summer from networking at the forum. Internships are very important because it is one thing to learn from a book or in class, but it is a completely different aspect to see it first hand. I have had potential jobs tell me that they love to see internship experience on a resume.

If I could give my freshman self any chunk of advice, it would be always to take opportunities that are in front of you, and it is never too early to get an internship. No matter what, there will be bumps in the road, but you have to keep going. And don't forget, you're never peaking. You're always on a plateau of excellence.

## The College Welcomes Three New EC Scholars

The College of Engineering and Technology has three new EC Scholars it can call its own.

EC Scholars is the most prestigious undergraduate award program offered at East Carolina University. The four-year merit scholarship recognizes outstanding academic performance, commitment to community engagement and strong leadership skills. Recipients receive an Honors College scholarship for four years, along with a stipend for study abroad, for a total value of almost \$62,000.



Zachary Barnett



Joshua Gurganus



Jiahao Li

Zachary Barnett is a French and biomedical engineering major and is from Pittsboro, North Carolina. He wants to be an innovative, entrepreneur once he

finishes at ECU.

Joshua Gurganus is also a biomedical engineering major and is from Greenville, North Carolina. Before he enters as a freshman in August, he's going to get certified as a pharmacy technician.

Winterville's Jiahao Li will either be a mechanical or biomedical major when he's done with his undergraduate work. Before that, however, he plans to be an ambassador of STEM education in eastern North Carolina.

Congratulations to Zachary, Joshua and Jiahao.

## Grant Funds Energy Needs, Education at Community Center

By Jules Norwood, ECU News Services

The Lucille Gorham Intergenerational Community Center will soon have some help with its electrical needs thanks to the sun, students and faculty in the East Carolina University College of Engineering and Technology, and a Constellation E2 Energy to Educate grant.

CET students partnered with the center to study its needs, equipment, appliances and layout, then conducted an energy audit to calculate the total energy consumption and the rate of energy consumption on a daily and monthly basis, said Dr. Ranjeet Agarwala, assistant professor in the Department of Technology Systems.

"We had originally talked about putting solar panels on the roof," Agarwala said, but based on the center's needs, a more portable and adaptable system was chosen.

The \$37,500 grant funded the purchase of 18 100-watt solar panels and nine portable power stations. Each power station can be charged from the solar panels and can provide power for anything from charging a cell phone to running a refrigerator.

Deborah Moody, director of LGCC, said the center's campus includes six buildings, so the flexibility of the portable systems made perfect sense.



**Dr. Ranjeet Agarwala (top left) and students at the Lucille Gorham Intergenerational Center test solar panels and a portable power station.** (Photo by Erik Panarusky)

"We wanted it to be simple and never have an excuse not to use it," she said.

The panels and power packs can be used during outdoor events, instead of running extension cords everywhere. They will also allow the center to function during power outages.

"Last year when we had the hurricane, we still had to come in because the community still has needs," Moody said. "But we didn't have any power in the building. So this would allow us to charge our laptops and go to work like we usually do."

In addition to offsetting daily energy consumption needs, powering events and emergency use, there's an educational component. The center has STEM-based

after-school and summer programs, and the students will be able to learn about topics ranging from energy conservation to converting units of power.

Each power station has multiple AC and DC outlets, as well as a digital display showing energy input and usage. The panels and the power stations can be connected in different combinations depending on specific energy needs.

During a demonstration of the equipment, the students were able to see how much energy was being generated by the solar panels and the impact of shadows, as well as the amount of energy drawn by a charging cell phone.

"It's exciting to watch the kids light up," Moody said. "We want to get them excited and interested in these fields to prime them and train them, and then have them grow up and contribute to the community."

"We also want the youth to help us think of other ways to use these to help save energy. And then they'll become advocates at home with their parents, and tell them, 'These are things we can do to save energy in the house.'"

The LGCC opened in 2007 and is operated through a partnership between ECU, the City of Greenville and Pitt Community College. Constellation's E2 Energy to Educate grants fund student projects focusing on energy science, technology and education.

## Research Experiences for Undergraduates Come to Another Successful End

The College's Biomedical Engineering in Simulation, Imaging and Modeling (BME-SIM) program recently hosted 10 students for 10 weeks thanks to a \$350,000 Research Experiences for Undergraduates (REU) grant from the National Science Foundation (NSF). Students from ECU, and other out-of-state universities, were exposed to cutting-edge research utilizing advanced computational models with applications in biomedical engineering. They closed out their stay with a poster session that outlined the individual research they conducted while here at ECU.

The program is a collaboration between engineering, kinesiology and physical therapy. The College's Dr. Stephanie George is the program's principal

investigator, and Dr. Zachary Domire from the College of Health and Human Performance is the program's co-PI.

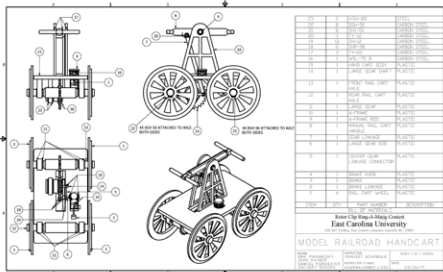
The College's Department of Computer Science also hosted its fifth, NSF-funded REU program, which ran from May 15 to July 21. The research theme centered on software testing and software analytics. 10 students, including three ECU students, were selected from 101 applicants nationwide. The home colleges for the other students included Wake Forest, Elon, UNC Chapel Hill, NC State, Shaw, Elizabeth City State, and the University of Alabama. Six faculty members from the Department served as research mentors for the REU students. This program also ended with a poster session from each of the participants.



## College Design Students Take 1st and 3rd in National Competition

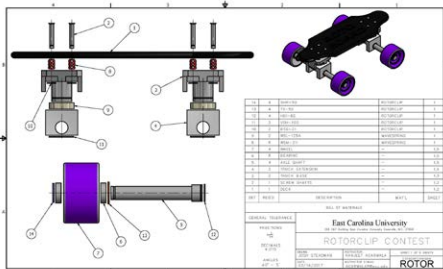
Two teams from the College's BS in Design program were first and third place winners in the recent Rotor Clip 2017 Ring-A-Majig contest.

### First Place Design



The first place winners included Erik Panarusk, Sam Poindexter, John Rayner and Zachery Rogers. Each team member received \$500 in prize money. In addition to their prize money, the team is invited to take a free trip to Rotor Clip in Somerset, New Jersey, to tour the company and attend the Atlantic Design and Manufacturing trade show at the Jacob Javits Center, New York City, June 13-15, 2017.

### Third Place Design



The third place winners included Joshua Steadman, Alex Senatore, Cedric Steele II and Colby Scott. Each team member received \$125 in prize money.

All the winners were students in Dr. Ranjeet Agarwala's junior level Rapid Prototyping course. All are also BS Design majors pursuing a mechanical technology concentration. The BS in Design is among five undergraduate and two graduate programs accredited by the Association of Technology, Management and Applied Engineering (ATMAE) and administered by the Department of Technology Systems, College of Engineering and Technology.

The fivefold objective of the contest was to: inspire critical thinking in the process

of finding solutions to problems, demonstrate how retaining rings are cost efficient and effective alternatives to traditional fasteners, apply sound engineering principles to the design process, foster individual and team initiative and spirit, and engender pride in the final design and satisfaction in the joy of discovery.

The entrants were tasked to design an actual device fastened entirely by retaining rings. Specifically, each was tasked to design a device that uses 10 retaining rings and a wave spring in the way each was designed to function. The components would be fastened on shafts and in housings/bore specifying the correct retaining ring and wave spring for the application.

Rotor Clip is a U.S. manufacturer of retaining rings, wave springs and self-tightening hose clamps serving the global automotive, distribution and general industrial markets. Through its affiliation with ATMAE, the company's goal is to support education in STEM (Science, Technology, Engineering and Math) through programs that expose students to "real world" situations and encourage them to pursue careers in manufacturing.



1st Place Winners. (Photo courtesy of Rotor Clip)

ATMAE, the other co-sponsor, is comprised of college and university educators, administrators, students, and industry professionals that sets standards for academic program accreditation, personal certification, and professional development for educators and industry professionals involved in integrating technology, leadership and design.



## PIRATE PROFILE - Engineering Student Michael Johnson



Michael Johnson

professor of engineering, to shed more light on Johnson's story.

"He is an inspiration for a variety of reasons. He balances responsibilities of working fulltime, caring for a family, and going to school with a significant commute from Edgecombe County.

As the latest Pirate Profile, engineering student Michael Johnson is an inspiration to others who find themselves in similar situations.

We asked Dr. Ricky Castles, assistant

Michael also is the kind of ambassador the college needs because we have a lot of people who come back to school for a second degree or to get their first degree later in life. He has worked hard to get through his degree and can relate to students of a variety of ages.

Michael proves it's never too late to use the key of education to open doors for a better future for yourself and your family."

And, on being listed as the professor who influenced Johnson the most, Castles says, "As a faculty member, it always feels great to be recognized for inspiring students. I think that is what all of us here work for...to impart something and hopefully make a positive impact."

**ENGINEERING & TECHNOLOGY TIMES** is published by the office of Marketing and Communications. You can read **ENGINEERING & TECHNOLOGY TIMES** online at [www.ecu.edu/cet](http://www.ecu.edu/cet) under the News tab. For more information about this publication, please contact Leslie Pagliari at [pagliari@ecu.edu](mailto:pagliari@ecu.edu) or Michael Rudd at [ruddm16@ecu.edu](mailto:ruddm16@ecu.edu).

---

## Future STEM Workforce - Duke Energy, ECU provide special camp to high school girls

By Rich Klindworth, ECU News Services

For the second summer in a row, the Engineering and Technology Summer Academy at East Carolina University provided rising ninth-grade girls hands-on opportunities to program small computers, survey land, work with water quality and tour technology companies - giving them a glimpse into what a career in a technical field could hold.

"You never really think about water quality until you actually get into science and start learning about, 'Hey, this is turbidity, pH, stuff like that,'" said academy participant Robyn Walker of Kinston. "You never really think about it until you sit down with the science teacher and actually learn about that kind of stuff."

For the adults involved, this camp is something many of them wished they had heading into the ninth grade.

"I personally was an engineer, mechanical engineer, but it was very unusual at that time for females to join engineering ranks," said Millie Chalk, a government and community relations district manager at Duke Energy. "The neat thing with this, starting in the earlier years, is that students have the opportunity to



**McKaylind Kilpatrick scoops up a sample of water during the recent Engineering and Technology Summer Academy at ECU.** (Photo by Cliff Hollis)

get their math lined up for future engineering courses. They also have the opportunity to explore a lot of different avenues, things that they might be interested in."

Duke Energy provided \$135,000 over the past two summers to sponsor the academies with the ECU College of Engineering and Technology. There were two separate week-long camps in which the girls lived in ECU residence halls. A total of 64 girls from Beaufort, Greene, Lenoir, Pitt and Wayne

counties have participated in the academy over the last two summers. "I did see myself in one of those girls. ... but I never had those opportunities as a young lady growing up to be exposed to such things. They really have worked hard and studied very hard to do it, so it's a great honor to be a part of it," said Donna Phillips, senior economic development manager at Duke Energy.

Duke Energy hopes this taste of science, technology, engineering and mathematics will provide them with skilled employees in the not-too-distant future.

"Duke has a plan to modernize our grid over the next 10 years. So a few of these students who are here today might end up being one of our employees before it's all over," Chalk said.

Thanks to Duke Energy, the summer academy at ECU was free for the girls to attend, and they were able to take their computers home with them. For students like Selena Rodriguez of Goldsboro, it was the first time she participated in a summer camp, which she hopes will help her decide what to do for a career in the future.

"What they've learned in a week, it's impressive. They're going to all be successful," Phillips added.