Student Jacob Bedekovich (left) works with a survey crew during the 2015 WVU Tech Camp STEM's civil engineering course. *Photo courtesy WVU Tech*

Students engineer their way into new fields at

WVU Tech's Camp STEM

WVU Tech's popular Camp STEM summer program marked its 11th year in 2015, bringing 45 high school students from throughout the state to the university's Montgomery campus for a week-long immersion in science, technology, engineering and mathematics.

In June, campers engaged in interactive, STEM-focused courses and activities where they learned about mathematics, biology, chemistry, engineering, computer science, forensic investigation, renewable energy and automobile technology.

Students also worked in groups to build and operate LEGO robots and visited the ACE Adventure resort, where they explored ecology and hydrology while zip-lining and whitewater rafting.

Dr. Kimberlyn Gray, WVU Tech chemical engineering professor and director of Camp STEM, said the camp is so popular because students get to see firsthand how their aptitudes in STEM fields can be applied to a real career – and many Camp STEM students are uncovering areas of study they are instantly passionate about.

"Camp STEM is built to guide students to different fields in an introductory way, though we've seen that students are going beyond those introductions and truly immersing themselves in the courses they enjoy. We're seeing students find something they're interested in – like robotics, for instance – and really dig into it here," Gray said.

"They won't take no for an answer and when they try something in that field and fail, they're coming back on their own time to try again. They take full advantage of the time they have at the camp to explore what they find fascinating. When they return home and start thinking about the courses they'll take in school next year, they have that experience driving them to keep exploring," she said.

Roane County High School student Macie Higginbotham examines bacterial growth under UV light in Camp STEM's biology lab. *Photo courtesy WVU Tech*

Jacob Bedekovich, 14, is a 10th-grader from Williamstown High School in Wood County. He said he wants to go to college after high school, but that he isn't sure what he wants to study. The Biology course at Camp STEM put the subject on the map for him.

"We learned how to grow bacteria and how to make them resistant to antibiotics – you can actually grow bacteria that can help people if they're sick," he said.

Macie Higginbotham, a 14-year-old ninth-grader from Roane County High School, attended the camp's courses in biology, chemical engineering, robotics and computer science. She said she was most excited to explore some of the science driving advances in the medical field where she ultimately wants to end up.

"I want to be in the health field. This camp isn't for that specifically, but I know that everything I learn here is going to help me in the future. I wanted to get into radiology, but after this week, I'm really interested in biology and chemistry, too."

Visiting students wrapped up the camp with a family picnic and the final robotics competition.

"It's a great camp and what they teach us is really useful," said Higginbotham. "I definitely want to come back next year."

WVU Tech officials expressed their gratitude to the AEP Foundation, the ECA Foundation, Dow, Toyota and AT&T, who provided financial support and lent the camp their time and talents. Camp STEM's sponsors ensure that students have access to the best activities possible and that students who can benefit most from the camp are able to attend.

ECA Manager of Corporate Affairs Jennifer Vieweg visited the camp to see its courses in action.

"The ECA Foundation is committed to promoting youth and education. We especially like to support programs designed to improve high school graduation rates, encourage college and career readiness and provide West Virginia with a well-educated and skilled workforce," she shared.

"Camp STEM contributes to all of these critical areas; it is a proven program with a great track record that continues to grow year after year. Interesting, interactive and engaging activities, like Camp STEM, help keep kids interested in these important fields so they will be better prepared to fill jobs in the 21st century," she said.

(Source: www.WVUTech.edu)

WVU Tech student helping to transform engineering education

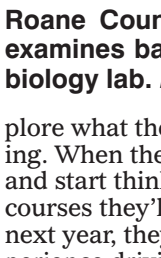
Amy Haddix is no stranger to advancing the field of engineering.

The chemical engineering major from Elkins has served as president of WVU Tech's Student Government Association for the past two years. She also serves as secretary of both the WVU Tech chapter of the American Institute of Chemical Engineers and the Association for Women Engineers, Scientists, Or Mathematicians Empowerment (a/k/a AWESOME) – promoting engineering education is just a part of who she is.

Last April, her passion for the field and leadership experience allowed her to represent WVU Tech at the American Society for Engineering Education's "Insights from Tomorrow's Engineers" workshop in Arlington, Virginia.

Haddix was one of more than 40 engineering students from schools throughout the nation to attend the event.

"Only a small percentage of engineering schools in the country were present at this conference. Being able to say that WVU Tech was represented brings a chance for others to hear about the school and all it can do" said Haddix.



Haddix

Funded by the National Science Foundation and ASEE, the event was the second phase of the "Transforming Undergraduate Education in Engineering" initiative, which is designed to determine the types of qualities engineering graduates should possess in the modern engineering environment.

The ultimate goal of TUEE is to create recommendations that colleges and universities can follow to instill these qualities in their engineering students.

The multi-year series of meetings completed its first phase in 2013, where students defined 36 Knowledge, Skill and Ability traits (dubbed KSAs) that would prepare future engineers to address modern engineering challenges.

"These were things such as good communication skills, self-drive and motivation and the ability to identify, simulate and solve engineering problems," said Haddix.

During the phase 2 workshop, Haddix said students worked in teams to discuss the importance of these KSAs within the engineering profession and determine how each KSA was being promoted in the more than 70 colleges and universities represented.

For Haddix, the workshop was an opportunity to exchange ideas with students from colleges and universities of all sizes; ideas that she could bring back to WVU Tech.

"Every school operates differently. However, we can still experience some of the same problems and want the same solutions," she said. "The big thing that I took away is a national need for practical application in hard science and math classes and projects in classes that apply classroom principles at an earlier level."

She said she's in the process of sharing what she learned, and that WVU Tech is producing graduates who can work effectively and confidently in the engineering industry.

An example of this herself, Haddix will graduate in May and has already committed to a production engineer position with the Dow Chemical Company in South Charleston.

(Source: www.WVUTech.edu)

WVU Tech academy connects girls to STEM possibilities

In late June, more than 20 girls from throughout West Virginia and surrounding states visited WVU Tech's Montgomery campus for the first-ever STEM Summer Academy for Girls.

The program immersed attendees in a week of STEM programming, including courses in biology, robotics, engineering, chemistry, computer science and pharmacology. Students participated in a variety of competitions and heard from guest speakers, including WVU Tech President Carolyn Long and Robin Anglin-Sizemore, science coordinator at the West Virginia Department of Education's Office of Secondary Learning.

Fourteen-year-old Piper Martin, a ninth-grade student at George Washington High School, already has her eye on college. She attended the academy to explore new fields and get a feel for what life in college is like.

"Usually in school you get sort of a brief introduction to careers, but I like learning more in depth about all the careers, especially in biology, because that's where I want to go," she said. "Knowing that it's really sterile in a lab and that you have to be careful when you're doing experiments is helpful. It gives me a picture of what I'll be doing."

Designed from the start as a means of demonstrating the application of STEM fields to everyday life, the academy took a unique approach to helping students process the program's educational offerings.

For instance, attendees participated in a competition where they worked with a budget to purchase materials such as cardstock, glue and tape to build a pair of shoes. Students had to consider engineering design elements to account for pressures and weight distribution in the shoes and had to test their designs on a 20-foot runway.

Students also participated in a weeklong project where they were asked to give a PowerPoint presentation on what they learned during the Academy. Dr. Afrin Naz, WVU Tech professor of computer science and academy organizer, said the competition served to boost teamwork skills and bring the concepts and lessons students learned together in a cohesive way.

"The group competition has been beneficial for many of these girls because it's been helping them with leadership, presentation and communication skills, and we're already seeing a change in some of them as they become more confident and vocal as they work within their teams," said Naz.

"By including the competition element, the students are paying more attention in each class. They're making connections between these fields and how one field can have an impact on another. They are also better able to articulate what they like and dislike in each field because they have to think about what they are learning in an analytical way," she said.

Naz said that the Academy also had a strong parental involvement component, where parents participated in the final competition and provided survey data before and after the program.

As a counselor, WVU Tech biology student Taylor Miltenberger said the academy was an opportunity to connect with young students headed down the path she's taking. Miltenberger, a first-generation college student, was able to share her experiences with students who will be in her shoes in just a few short years.

"I didn't have this kind of opportunity when I went to school – it was always just pick what you like and you don't always know until you're in it whether you really enjoy a field. Students can picture themselves in these careers here because of the activities we've been going over with them. They get to see what a biologist or an engineer really does and they can connect with that," she said.

Many of the academy's attendees shared that the all-girls format of the academy was a draw for them, as it allowed students to start the program on common ground with girls who hold similar interests.

Stephanie Fletcher graduated high school a year early from Independence High School in Coal City and planned to study chemical engineering at WVU Tech in the fall. She said she had originally applied to attend WVU Tech's co-ed Camp STEM, but changed her mind when she heard about the all-girls academy.

"In engineering and science fields, you're always going to be outnumbered by guys, so I liked how it focused more on the impact that women can have and the job opportunities women have," she said.

"I did a lot of research and thought I would go into the medical field. The more I looked, the more I realized that I liked engineering. I want to work in manufacturing and work on creating things with an economical and environmental emphasis. It's been great to learn about careers from professors and speakers who know what's going on for women in these fields," Fletcher said.

Academy students took their experience on the road during the camp as well, visiting Toyota Motor Manufacturing West Virginia's plant in Buffalo, where they toured the company's manufacturing facility and met with the plant's president, Millie Marshall. The group also visited the Clay Center in Charleston.

The STEM Summer Academy for Girls was sponsored by Toyota and AT&T, who gave generously of their time and talents to ensure that girls from throughout the state and beyond could experience the program. WVU Tech thanks these companies for their support.

(Source: www.WVUTech.edu)