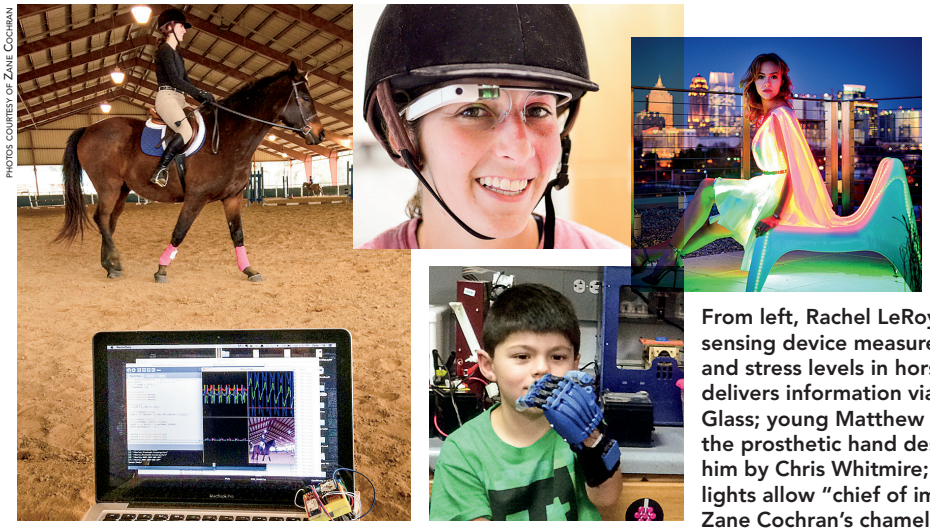
Dr. Stephen R. Briggs

PHOTOS COURTESY OF ZANE COCHRAN



From left, Rachel LeRoy's digital sensing device measures movement and stress levels in horses, then delivers information via Google Glass; young Matthew shows off the prosthetic hand designed for him by Chris Whitmire; sewn-in LED lights allow "chief of imagination" Zane Cochran's chameleon-like PIXI dress to change appearance on demand using a computer or smartphone app.

HackBerry: JUSTIMAGINE!

Imagine an academic major that encourages playful curiosity.
Imagine faculty who assign good grades for spectacular failures.
Imagine a program focused on solving problems and helping others to be more and do more.

AT BERRY, THAT ACADEMIC PROGRAM IS CALLED CREATIVE TECHNOLOGIES, and it is the first undergraduate degree of its kind in the nation. This new major includes a set of interdisciplinary courses that focus on technology, design thinking, computer science and business while using project-based learning as the means for inspiring creative and analytical problem-solving. Students gain firsthand experience with digital and traditional technologies ranging from 3-D printing and programmable logic controllers to woodworking and welding.

The major, however, is not a series of shop classes in preparation for a trade. Rather, it is a study of how people use objects every day, an opportunity to imagine what might be possible, and a disciplined approach to the hard work of bringing an idea to life.

At commencement one year ago, I challenged graduates to "Be Berry" – to be those who see what others need, who discern the problems and engage others to find the creative solutions that improve the places where they live, work and serve. I did not anticipate that Dr. John Grout, dean of the Campbell School of Business, would take special note of that challenge, but he later pointed out that it captures the ethos of the creative technologies major and the culture of the program's workspace affectionately known as "HackBerry Lab." Although "hack" often is associated with a nefarious side of the computer coding culture, the word's larger meaning has to do with creative problem-solving through adaptive reuse or repurposing, making HackBerry an apt name, indeed, for this cradle of creative technologies.

HAND-PICKED COLORS AND TALKING HORSES

Junior Chris Whitmire had already taken the Innovation, Design and Prototyping course with Dean Grout when he watched a YouTube video on how to make a prosthetic hand with a 3-D printer. Intrigued, he approached Dean Grout about the possibility of customizing such a hand.

Dean Grout was game, and one thing led to the next. Working with computing code made available by the e-NABLE foundation, Chris was able to customize a prosthetic hand for a local boy named Matthew, delivering for just a couple hundred dollars what would have cost $10,000 commercially. Chris fit the hand for Matthew's size and personalized it in colors of the boy's choosing – black and blue. The low cost means a succession of hands is now affordable for Matthew as he grows and matures.

Chris continues to explore how these prosthetic devices can be modified to meet the needs of the recipient – hands fashioned for hobbies, for example, such as playing the trombone or a specific sport. He also is interested in developing sensory devices that can provide feedback to the wearer – a sense of touch – to complement the hand's movement.

Chris came to Berry interested in the dual-degree engineering program, physics and biology. One of his biology professors recommended that he take a course in physical computing taught by Dr. Nadeem Hamid (computer science) and Zane Cochran (creative technologies). In that course, Chris was introduced to the world of Arduino, an open-source prototyping platform designed for students without a background in electronics.

Arduino offers microprocessors and a computing language that allow students to build and connect inputs (a touch, a sound) with outputs (turning on a motor, turning off a light). The Arduino technology is flexible and simple, yet capable of supporting complicated and advanced projects. It didn't take long for Chris to be hooked. As a student who commutes from nearby Cedartown, he was soon "living in the lab," and he still spends much of his spare time there, energized by the community of creative makers.

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Jacob Ramsey, left, and Chris Whitmire work to get the "Lunar Lemon" ready for competition.

Although the creative technologies major was still under development when she graduated, Rachel LeRoy (15C) had a similar experience. With broad interests, Rachel explored several majors in science and business before completing her degree as a marketing major. She also directed the Viking Furniture student enterprise and competed on the varsity soccer and equestrian teams.

As an athlete, Rachel understood the importance of attending to wear and tear in her own body. But how could she tell if the horse she was riding was experiencing similar stress? Rachel collaborated with classmate Arden Foster (15C) to answer this question by developing a digital sensing device that attaches to a horse's leg, measuring movement and stress levels and delivering the information quickly and visually to the rider through Google Glass.

Rachel is now working on a master's degree in human-computing interaction at Georgia Tech, and she continues to refine this and other devices.

FAIL FAST, FAIL FORWARD

Rachel and Arden developed their system through a process of iterative experimentation, a central thesis for design thinking and incremental improvement. Students are encouraged to dream ambitiously beyond what they know how to do. They are challenged to embrace "unknown unknowns."

Bringing a dream to life requires a willingness to generate many design solutions and to pursue a path of failing rapidly forward. Rather than investing in one highly planned but expensive experiment, this approach emphasizes many small wagers of limited risk. It is a variation on the trial-and-error process of the scientific method.

To teach this way of thinking, the creative technologies major uses project-based assignments. The core courses have teams of students working on three or four prototypes each semester. To encourage rapid failures, the faculty may establish unreasonable time constraints, such as asking a new team to build something from scratch in four hours.

Recently, a Berry team took on a substantial challenge by participating in an endurance race with a considerable design constraint – that the vehicle entered cost $500 or less. The team's entry was the "Lunar Lemon," a vintage Chevy Astro van purchased from the Berry physical plant and adorned with racing seats, wings and "rocket boosters" fashioned from recycled materials. Although the vehicle failed its initial inspection at the test track, the team worked tenaciously for 40 straight hours to rectify the problems. The Lunar Lemon then completed 95 laps (approximately 225 miles) without mechanical issues, thereby earning the "Eternal Optimist Award" from race judges.

Hackathons – periodic forays that introduce students of all kinds to the joys of ingenuity and inventiveness – also are offered. Individuals or teams compete to complete a design challenge that often includes specific constraints of time or materials. Artists and chemists are as welcome as computer geeks; the atmosphere is intensely fun.

MAKING SPACE FOR MAKERSPACES

Great spaces inspire great performances. In this context, the place itself helps shape the culture of creativity – not that the physical computing lab had been much to look at until recently. The original HackBerry Lab consisted of only two small, windowless rooms in McAllister Hall. Still, something magical happened. Within a year, the program had expanded so rapidly that additional space for project development was borrowed from 7Hills Makerspace in downtown Rome, courtesy of Tricia Steele (09C) and Greg Richardson.

In April, the HackBerry Lab moved from McAllister Hall to a new fabricated building adjacent to the Emery Barns, growing from 900 square feet to 3,500. In typical fashion, creative technologies students and faculty accomplished the move in an evening, installing equipment, building new work tables, and creating nooks and zones of activity.

JUST IMAGINE

This May, the first two students – Maciel Smith and Travis Helton – graduated with degrees in creative technologies. In addition to their resumes, both have a portfolio displaying 10 of their creative products. Travis' portfolio sparked spirited conversations when he visited with startup entrepreneurs at Atlanta's Tech Village.

Travis grew up working in a hardware store owned by his family. His mother, Kim Waters Helton (81C), and grandmother, Carol Waters (72C, 75G), are Berry alumnae, and Travis came to Berry to study business. From the start, he worked in the Berry Information Technology Students (BITS) program – first as a PC technician and then as a student supervisor – earning four certifications from CompTIA and Microsoft. He also served as a mentor for a Maker Academy, working closely with students from Rome High School and teaching concepts of soldering, programming, 3-D CAD design, idea generation and prototyping.

On the side, Travis co-started a business repairing mobile phones and upgrading computers, work that led to one of his design projects, Finally Open, a simple device that uses suctions cups and levers to separate screens from their phones. Another of his inventions, BabySaver, uses a Bluetooth phone connection to alert drivers who accidentally walk away from their automobiles with a baby still inside.

Travis now foresees a life in which he is always a "tinkerer, builder and creator." His grandmother recently wrote a note to Dean Grout thanking him for caring enough to design a new major that was such a perfect fit for her grandson. In effect, she thanked Dean Grout and the Berry community for practicing what we preach – and what we teach.

A college that embraces the "unknown unknowns." **Imagine that!** B