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tech QUARTERLY

The Magazine of Forsyth Technical Community College

in this issue:

Our Sputnik Moment

PRESIDENT OBAMA VISIT SPOTLIGHTS TECHNOLOGY & INNOVATION AT FORSYTH TECH

President Obama wanted the right setting for a speech to rally this generation of Americans to their "Sputnik Moment."

Forsyth Tech's growing national reputation for preparing the workforce of today and tomorrow made the school a logical choice.

The President aimed to raise Americans' awareness of the challenges of global competitiveness. He wanted to demonstrate that to be able to compete in the future, the American workforce must include people who have been trained to work with cutting-edge technology. Not just the people with Ph.D.s who head laboratories and corporations, but also those who work for them at many levels and must be knowledgeable, creative, flexible and ready for the fast pace of innovation.

When he walked through labs and classrooms at Forsyth Tech, President Obama saw that workforce of the future. He saw students from diverse backgrounds. Some were decades older than others. Some were fresh out of high school; others had many years of experience in traditional industries before finding themselves out of a job. Some already had college degrees, even advanced degrees.

One thing they all had in common was a determination to learn the innovative, sophisticated skills that would help them get good jobs in industries that are thriving and growing – the jobs that will drive the economy of the future. Another common bond was that they were all finding the teachers, the equipment, the vision and the support they need at Forsyth Tech.

Tomorrow's Jobs Today

Forsyth Tech offers numerous traditional programs. Many of them, such as those in the medical fields, are incorporating the latest technology so that graduates will be ready to step into emerging jobs. And not all innovations – or all jobs – are in high-tech fields with unfamiliar names. There is healthy demand for highly skilled workers in advanced manufacturing jobs, and Forsyth Tech is training welders, machinists, design technicians and others to fill those needs.

But it's in the newer fields that Forsyth Tech is gaining national attention as an innovative leader in preparing that highly competitive workforce for the future. Biotechnology, nanotechnology, digital design, clinical health, green and sustainable practices – these are fields that offer abundant possibilities for jobs and economic progress.

Working with industry leaders in Winston-Salem and Forsyth County and beyond, Forsyth Tech's leaders have been out in front, developing the programs needed to keep the labs, medical centers and industries running productively in the future.

Biotechnology

For Alan Beard, the chairman of Forsyth Tech's Department of Biotechnology, President Obama's "Sputnik Moment" visit was personal and immediate: Trailed by an army of cameras and reporters, the President visited Alan's lab, where second-year students were working with cell culture and recombinant DNA. When President Obama spoke to him, Alan began to respond: "And then these boom microphones came down, and instead of me talking just to him, I was talking to the whole planet."

But that was OK. There's plenty to say about the Biotechnology Department. Alan was struck by how the President asked students about their backgrounds.

"He was interested in the diversity of our students," Alan said. "That's what our program is all about.

The program is open. If you didn't take much science in high school, we'll give you a refresher course. If you've been working for 25 years in a job that's been outsourced, and you need help with math, we'll teach you the math."

The biotechnology program, which offers an Associate of Applied Science degree, got its start in 2002 and graduated its first students in the summer of 2003. Like many of Forsyth Tech's programs, biotechnology was started in response to requests from the community in Winston-Salem, the "city of arts and innovation."

Employers such as Wake Forest University Baptist Medical Center, The Wake Forest Institute for Regenerative Medicine, Targacept, Inc., and other businesses in the developing Piedmont Triad Research Park wanted a ready supply of skilled biotech workers. "I teach biotechnology, not rocket science," Alan Beard says. "It's a big-sounding word, but it is technology, and you can be trained to work with it. We are not training the Nobel Prize winner, but rather the technician. The Ph.D. directs the principal investigation, and the technician is needed to do the basic lab work. Many of the local jobs involve basic research and analytical testing. We work pretty closely with local employers. We are continually adapting our curriculum to meet their needs and keep our students current with state-of-the-art skills, equipment and instrumentation."

The college-industry relationship is a two-way street. Every Forsyth Tech biotechnology student completes an internship in which he or she can put that hands-on education to work. Local employers offer internships, which can help students land a full-time job after graduation.

Alan Beard, Forsyth Tech Department Chair, Biotechnology

Extended Network

Alan Beard's Biotechnology Department fits smoothly into statewide and national efforts to develop the workforce of the future. The meshing is all the easier because both the NC Community College System's BioNetwork and the National Center for the Biotechnology Workforce are affiliated with Forsyth Tech.

Doug Drabble started working as Forsyth Tech's Pharmaceutical Center Director three and a half years ago after two decades in the pharmaceutical industry. This year, he became Director of the BioNetwork and Life Science Initiatives, and he still works closely with Forsyth Tech, as well as with the state's other six BioNetwork centers. When he's not in Raleigh, his office is in the Richard Dean Building in the Piedmont Triad Research Park – a booming scientific and industrial park on the edge of downtown Winston-Salem.

The BioNetwork's two main missions dovetail neatly. It gives regulatory, analytical and operational training to workers already in the life sciences industry. That might mean developing short courses to help life science companies meet FDA requirements, or helping employees master their company's new high-tech equipment.

And as Doug Drabble and the BioNetwork see the needs of the state's industries, they get ideas for new curriculum courses for Forsyth Tech and other community colleges.

When Doug was still on staff at Forsyth Tech, he realized that a range of industries across the state needed employees with analytical training. Not just the pharmaceutical industry but also those that deal in chemicals, cosmetics, healthcare and other fields needed people who could use highly sophisticated instruments to analyze small molecules.

There didn't seem to be any comprehensive facility offering that kind of training, so Doug put together a plan for one. Grants and donations helped build *a 4,300-square-foot center in the Triad Research Park* with 1,800 square feet for hands-on analytical training with the latest equipment. Since the center opened in July 2009, it has trained about 2,500 people (and has contracts to train several thousand more).

Income from training for companies goes to scholarships for community college students and teachers, who can get the same innovative training at no extra expense. Doug said that more than 100 students have earned a certification of completion for the analytical training. "We are able to support that student who is looking for training or personal development to help get that job at the end of the road," he said. It could be the difference between getting a job or not.

"That's what we do. We are here to support the community college system and to support every student as well. "

Doug Drabble, Director of BioNetwork and Life Science Initiatives, NC Community College System

"Reach for the Stars"

Russ Read was not surprised when he learned that President Obama was coming to Forsyth Tech. From his office on the fifth floor of the Tech Building on Forsyth Tech's Main Campus, he directs the National Center for the Biotechnology Workforce (NCBW). He knows firsthand the reputation Forsyth Tech has as a model of technology and innovative education. Russ is a liaison between Forsyth Tech and the state's community college system, and Washington and the rest of the nation. Created in 2004, NCBW was financed for its first four years by a High Growth Grant from the U.S. Department of Labor. The state picked up the tab after that, and NCBW is now an important part of BioNetwork.

NCBW's goal is to help develop best practices for curriculum and continuing education that meet the needs of those doing the hiring and those whom they will hire in the fields of biotechnology, pharmaceuticals and life sciences. In September 2010, the center and the Manufacturing Institute in D.C. announced an alliance to develop the workforce of the future in those areas.

As part of that effort, Russ tracks what becomes of graduates of Forsyth Tech's biotechnology program. What he finds is encouraging. A number of two-year graduates go on to get four-year degrees elsewhere. But of those who want biotechnology jobs, "most of them got jobs," he said. There are *plenty of jobs for skilled people who know how to use sophisticated technology* and how to work as part of a team – both areas that Forsyth Tech focuses on.

One reason for the success is that "North Carolina is a biotech state – the jobs are here," Russ said. The internships and close relationships with employers in Winston-Salem and the Piedmont Triad region help. And so does Forsyth Tech's approach to hands-on, practical, real-world training.

"We train a mixed lot of students," he said. "Often, we find that people who were good at working with tobacco, textiles or furniture are also good working with biotechnology."

"Forsyth Tech has been ahead of the curve in biotech training," Russ said. "Dr. (Gary) Green (the president) is always reaching, encouraging people to go to the next level, to go as high as you can. We just reach for the stars here, and it seems to work."

Russ Read, Executive Director, National Center for the Biotechnology Workforce of BioNetwork at Forsyth Tech

"I Make High-Tech Jobs for Americans"

If you ask Dr. Kevin Conley "Just what is nanotechnology, anyway?" he tends to dodge the question. Maybe Kevin, the coordinator of Forsyth Tech's 6-year-old nanotechnology program, would rather talk about the positive things nanotechnology does for our economy and society than offer possibly confusing details about how and why nanotechnology reduces one of the three dimensions of matter to 1,000 or fewer atoms.

Here's how Kevin describes his own job: "I make high-tech jobs for Americans." Here's how he describes nanotechnology: "Nanotechnology in North Carolina uses systems of biology with chemical structures and devices from physics to do engineering in biological and material systems for the promotion of the state's economy in an ethical fashion that is good for people and the environment."

Whew.

Nanotechnology, he says, uses all the sciences. Students of nanotechnology also must learn about economics and ethics. The focus is "on getting the job done, not just throwing a set of tools at something." The tools, however, are undeniably cool. Nanotechnology uses extremely tiny machines to get its jobs done, whether the job be speeding the creation of pharmaceuticals for better healthcare, creating better solar cells for a greener future, or any of seemingly limitless possibilities.

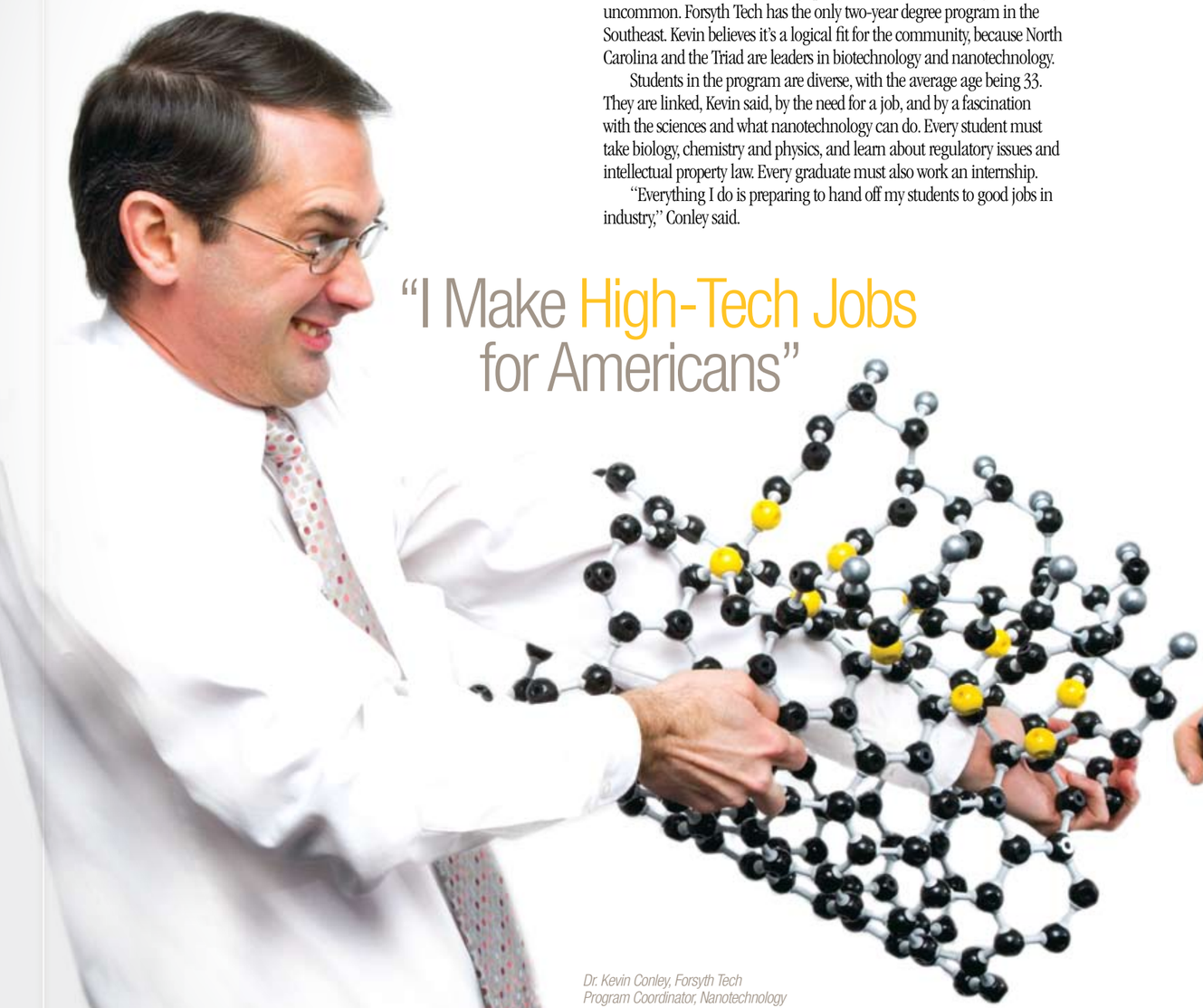
At some point, Kevin said, his students usually say something like,

"Holy cow! I am working with millions of dollars worth of equipment looking at atoms!"

Two-year community college programs in nanotechnology are uncommon. Forsyth Tech has the only two-year degree program in the Southeast. Kevin believes it's a logical fit for the community, because North Carolina and the Triad are leaders in biotechnology and nanotechnology.

Students in the program are diverse, with the average age being 33. They are linked, Kevin said, by the need for a job, and by a fascination with the sciences and what nanotechnology can do. Every student must take biology, chemistry and physics, and learn about regulatory issues and intellectual property law. Every graduate must also work an internship.

"Everything I do is preparing to hand off my students to good jobs in industry," Conley said.



Dr. Kevin Conley, Forsyth Tech
Program Coordinator, Nanotechnology

Serious about Gaming

"I come to work, and I just play every day," said Herb Burns, Department Chair, Architectural & Construction Technologies. So do the 20 or so students who are fortunate enough to study in the two-year applied science program. Visit their lab, and you will see them drawing on electronic sketch pads, creating films with scary monsters, playing highly sophisticated video games of their own creation and even popping figures out of a 3-D printer that looks a bit like a vending machine.

The play is serious, though.

It's all about jobs of the future.

One need look no further than the Forsyth Tech website to see one of the practical applications of what DEA students are learning: A team in one of his classes formed a mock animation company called Shock Treatment and produced from start to finish "The Story of You," a recruitment video.

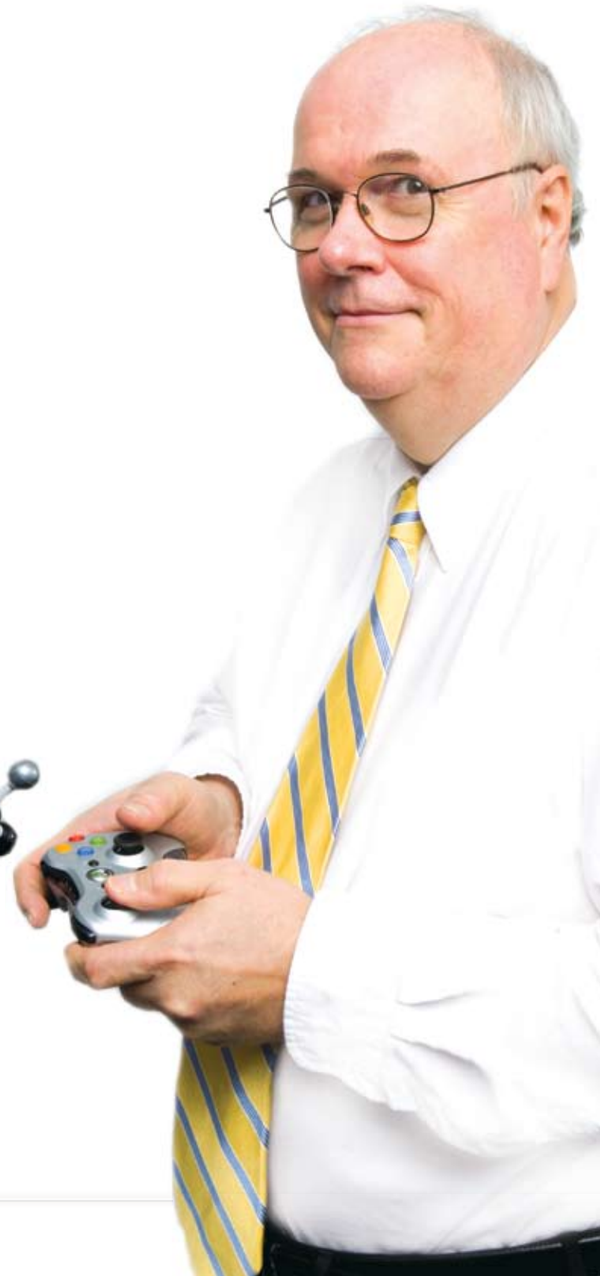
Creating and playing video games is one of the attractions of the program, and Herb said that some students may find work along those lines. Or they might create a fun "app" that can be played on a smartphone, and develop a lucrative small business.

But they also learn about "serious gaming," a rapidly growing field that provides, among other things, games that are used to train medical professionals, first responders and the military. Last year, some Forsyth Tech students participated in a consortium modeling surgical instruments for a surgical training game.

There is a wide range of other real-world uses for the skills the program teaches. Movies and cartoons use animation, of course, but so do TV commercials and just about anything that portrays motion.

The art of 3-D modeling also has wide applications. Recently, some of Digital Effects and Animation Instructor John Kelly's students worked with an international team of researchers to build 3-D models of buildings in an ancient village in Abu Dhabi, which became part of a virtual reality of the village.

The program takes advantage of what Herb describes as a "very collaborative community" in the Winston-Salem area, working with the Center for Design Innovation as well as Wake Forest and Winston-Salem State universities and the University of North Carolina School of the Arts.



Herb Burns, Forsyth Tech
Department Chair, Architectural & Construction Technologies

Computerized Simulators

The way Dr. Jan Overman sees it, sophisticated technology has made healthcare training safer for patients and less terrifying for students. Jan, Forsyth Tech's Dean of Health Technologies, considers the simulation lab a revolutionary change in the way people are taught to provide a range of medical services.

When Jan was in nursing school, she said, students usually practiced on one another as they learned various procedures. That meant they were practicing mostly on young, healthy people. Today, patients in hospitals are very ill. The simulated patients – highly computerized, much more than just mannequins – in the lab can be programmed to present the real problems that healthcare workers will encounter on the job.

The simulator's pulse, respiration rate, heart rate and other factors can be set to offer challenges that require the student to use critical thinking to make the correct choice about treatment. Then the instructor can use a printout to review, for the whole class, how the student made the decision.

"This is a wonderful way to teach complex healthcare scenarios," Jan said.

Simulators range from infants to adults. They can simulate the birth process with the mother or baby in distress, or simulate an intravenous stick for a dehydrated geriatric patient with rolling veins. Students can decide how best to treat the individual patient – without dealing with a living human while they are still learning. Simulators are a new and invaluable bridge between classroom instruction and treating real people.

Forsyth Tech is hardly the only community college to use simulators in its healthcare education, but Jan said its approach is unusual. Rather than just buying expensive equipment that faculty may not use, Forsyth Tech established a position, coordinator of the simulator lab. The coordinator makes sure that instructors know how to use the simulators effectively.

Dr. Jan Overman, Forsyth Tech
Dean, Health Technologies

Tech Revolution, Updated

In the Thomas H. Davis *i*TEC Center, Jim Pierson makes sure that programs that are now the granddaddies of innovative technology – computers and the Internet – stay ahead of the curve. He is constantly working with the industry locally and nationally to make sure that Forsyth Tech is training students for the jobs of the future in database management, information security, Web technologies, programming, network technologies and computer information technology.

In each area, he keeps his eyes on the marketplace and his ears open for the latest buzzwords. Take "virtualization," for example, the creation of virtual computing environments that are more efficient than traditional ones. Workers may have their own monitors but be connected to a server somewhere else. At Forsyth Tech, students learn how virtual labs work, even as they learn specific information using them.

The iTEC Center partners with companies like Microsoft, Red Hat and Cisco, using their latest products in "academies."

Pierson is developing training in programming mobile devices so that students will be able to tap into the lucrative markets for "apps."

The Center is developing a new program in Healthcare Business Informatics, in line with President Obama's call for more efficient and useful handling of healthcare records.

Pierson is also heavily involved in making sure that Forsyth Tech practices what it preaches: It does not just teach about innovations and new technologies; it also makes use of them in its teaching methods and operations.

Jim Pierson, Forsyth Tech
Department Chair, Thomas H. Davis iTEC Center

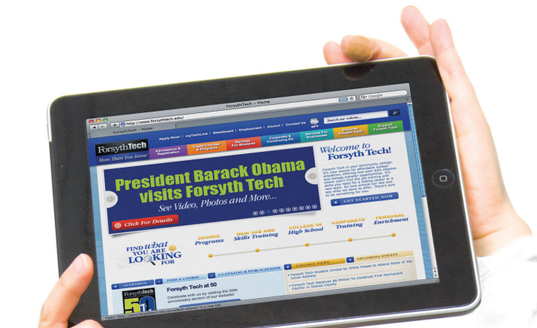
The Big Picture

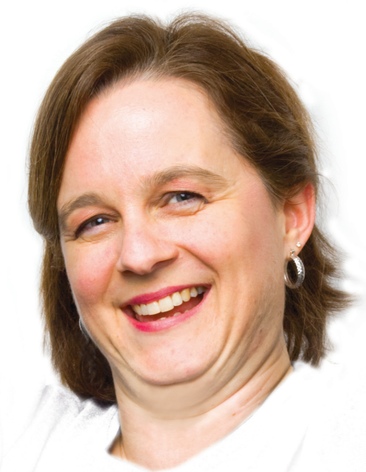
That's an area that comes under the supervision of Rachel Desmarais, Forsyth Tech's Vice President of Planning & Information Services. It's important, Rachel said, that Forsyth Tech teaches by example. Of course, great effort goes into making sure that students are taught using the latest in innovative technology, whether it be virtualization, distance learning, whiteboards or something as simple as electronic "clickers" that help students respond to teachers' questions in class.

Rachel is always thinking about ways to make students' total college experience better, through wireless hotspots where they can get online, communal areas where they can gather to work on projects, or "electric juice bars" where they can charge their devices. Forsyth Tech's diverse students don't always have access to computers, so more computer labs with easy access are essential.

Beyond all that, she believes it's crucial that students see that Forsyth Tech lives what it teaches. That can mean doing things in a greener and more sustainable way. Existing buildings can be made more energy efficient. Some new ones will be built with some form of LEED (Leadership in Energy and Environmental Design) certification.

"Learning really occurs at the intersection of the personal experience and the technology," Rachel said. "We don't want to do one at the expense of the other. Here at Forsyth Tech, it all goes together."





Rachel Desmarais, Forsyth Tech Vice President, Planning & Information Services

A Leg Up on Getting a Good Job

When Steven Crawford graduated from the University of North Carolina at Chapel Hill in May 2010, he knew a couple of things he did not want to do.

He did not want to go straight into graduate school, even though that's what many of his classmates at Carolina were planning. And he did not want to join the ranks of college graduates who were unemployed in a tough economy.

So Steven took a different approach: He applied to Forsyth Tech's two-year nanotechnology degree program. Now, because he was able to transfer many credits from Carolina and he's taken substantial course loads, he's on track to graduate again in May 2011. This time, he will add an associate's degree to the bachelor's degree on his resume.

Steven Crawford, Forsyth Tech Nanotechnology Student

And, given the track record of Forsyth Tech's nanotechnology program, he has reason to believe that he may also have a good job offer by that time.

Steven doesn't regret his four years pursuing a B.A. degree in biology at Carolina. "You get a really good general and theoretical basis in biology there," he said. "It prepares you for graduate school. But it doesn't really prepare you for an actual job. Graduates with bachelor's degrees in biology are a dime a dozen. To get a job, you need more practical preparation."

That belief is what brought him to the nanotechnology program. "I wanted to get out and get working somewhere and get some practical experience," he said. "If I do want to go back for a master's degree later, I will know what I want to focus on."

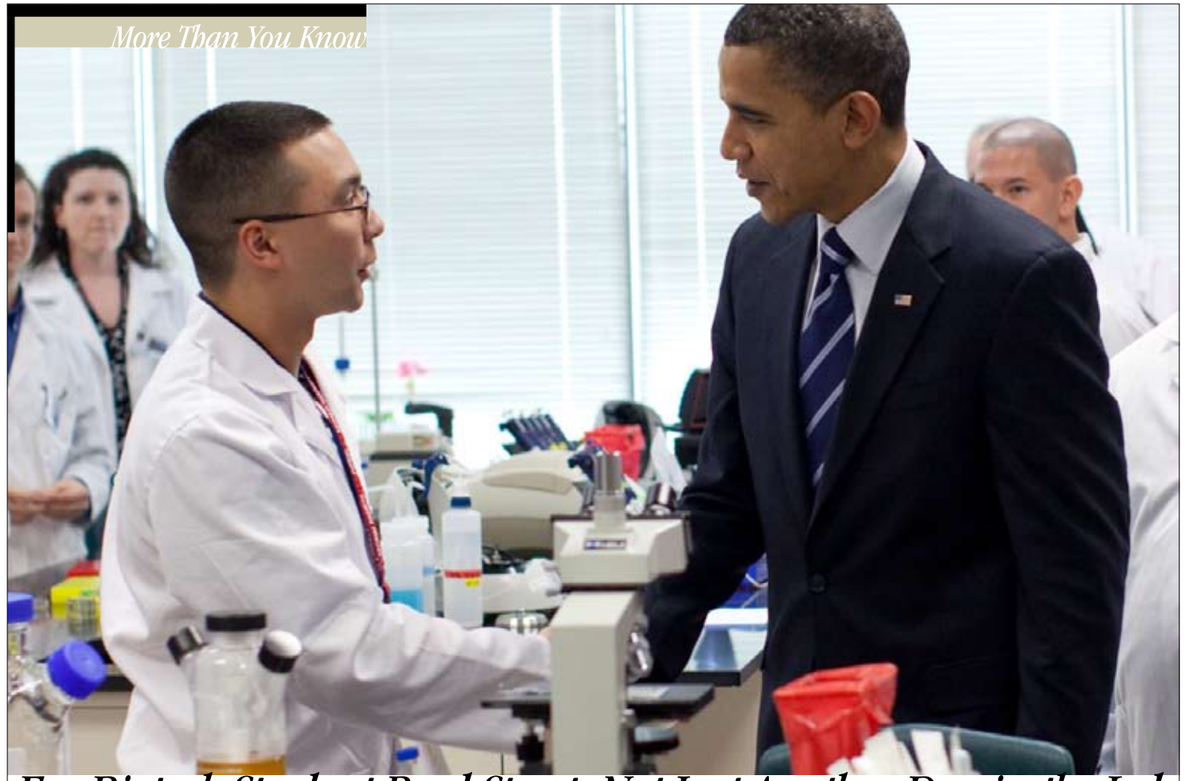
Steven's pleased with what he's found at Forsyth Tech. His studies are similar but different. The biology he's learned is useful, and he's learning applications for it in nanotechnology.

He knows a lot of people would consider the path he's taken "very unorthodox," but it makes sense to him. This spring, he will participate in a co-op education program in which he'll get practical experience at a company in the area that uses nanotechnology. Forsyth Tech is fortunate to have more than enough of such companies in Winston-Salem and the Triad that welcome its students. Crawford knows that a number of Forsyth Tech's internships and co-op positions have turned into regular jobs after graduation.

His dream entry-level job would be to work in a research or a forensics lab. "I want something where when you get into work every day, it's not the same old, same old," he said. Later, he might aspire to be a lab manager.

Driving to Forsyth Tech's Main Campus daily from his home in Kernersville has been a very different college experience from living on campus in Chapel Hill for four years. But different can be good. "At Carolina, there might have been 200 people in a lecture, while now Dr. (Kevin) Conley might have fewer than 10 in a class. Forsyth Tech's program is a lot more intimate, and we get more practical and hands-on experience," he said. "This program is certainly a lot cheaper than grad school, and it's arguably just as good for your resume."

"Some people might say coming to Forsyth Tech after Carolina is a step down. I look at it as a leg up – a leg up on getting a good job."



More Than You Know

For Biotech Student Paul Street, Not Just Another Day in the Lab

So let's say the leader of the Free World walks into your classroom. What do you chat about?

"One guy asked him about college football," said biotech student Paul Street. "That kind of set the mood before he started asking more serious questions about what would make it easier for us to get a degree while working and having a family."

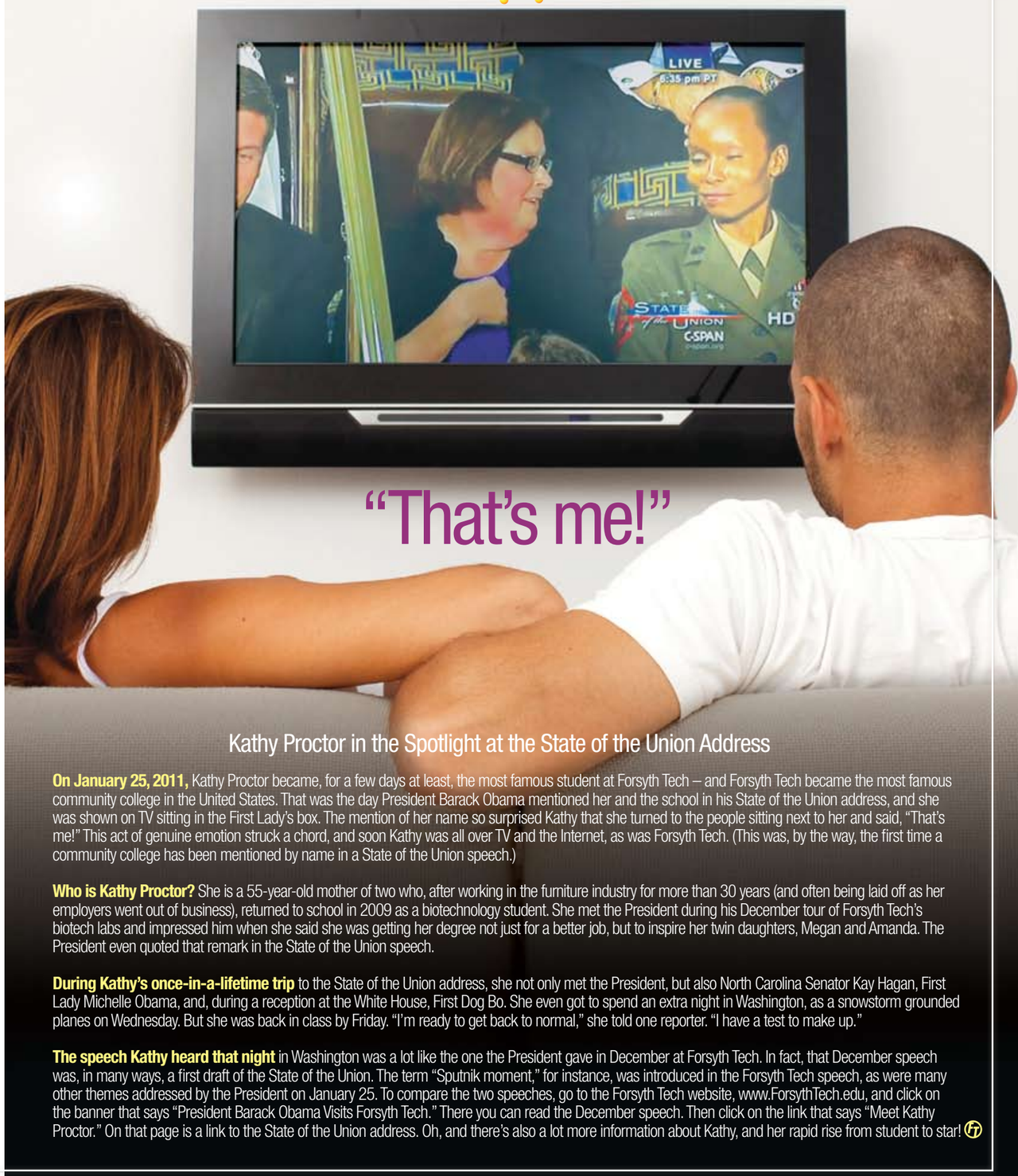
Paul was one of the students President Obama spoke with in the Technology Building. In fact, Paul had the opportunity to explain an extremely complex cell culture experiment in a scant few minutes. "When I was explaining about the cell culture, he was looking through the microscope and said 'It's alive!'"

"We had talked about the experiment in class before," Paul said. "It worked out surprisingly well for being on the fly. Mr. (Alan) Beard's class had prepared me pretty well for it."

Paul already has a biology degree from Wake Forest. He's taking this class to gain more extensive lab experience. "I've learned a lot," Paul said. "Employers in this field aren't looking for a lot of experience in the classroom; they're looking for experience in the lab. My degree has mostly field work. If you can't do hands-on science, you can't do science."

Paul is a member of the Army. His talk with President Obama was also a chance for him to size up his Commander in Chief. "He's taller than I expected," he mused. "You usually see him with Secret Service agents, and they are generally pretty tall. Pretty nice guy."

"We were told to only expect very quick handshakes before he left," Paul recalls. "But he came in there with Governor Perdue and Dr. Green, and shakes hands and spends five minutes talking to Mr. Beard and Dr. Green, and another five minutes talking to me about cell culture. Wow, we didn't expect that. We were pleasantly surprised."



"That's me!"

Kathy Proctor in the Spotlight at the State of the Union Address

On January 25, 2011, Kathy Proctor became, for a few days at least, the most famous student at Forsyth Tech – and Forsyth Tech became the most famous community college in the United States. That was the day President Barack Obama mentioned her and the school in his State of the Union address, and she was shown on TV sitting in the First Lady's box. The mention of her name so surprised Kathy that she turned to the people sitting next to her and said, "That's me!" This act of genuine emotion struck a chord, and soon Kathy was all over TV and the Internet, as was Forsyth Tech. (This was, by the way, the first time a community college has been mentioned by name in a State of the Union speech.)

Who is Kathy Proctor? She is a 55-year-old mother of two who, after working in the furniture industry for more than 30 years (and often being laid off as her employers went out of business), returned to school in 2009 as a biotechnology student. She met the President during his December tour of Forsyth Tech's biotech labs and impressed him when she said she was getting her degree not just for a better job, but to inspire her twin daughters, Megan and Amanda. The President even quoted that remark in the State of the Union speech.

During Kathy's once-in-a-lifetime trip to the State of the Union address, she not only met the President, but also North Carolina Senator Kay Hagan, First Lady Michelle Obama, and, during a reception at the White House, First Dog Bo. She even got to spend an extra night in Washington, as a snowstorm grounded planes on Wednesday. But she was back in class by Friday. "I'm ready to get back to normal," she told one reporter. "I have a test to make up."

The speech Kathy heard that night in Washington was a lot like the one the President gave in December at Forsyth Tech. In fact, that December speech was, in many ways, a first draft of the State of the Union. The term "Sputnik moment," for instance, was introduced in the Forsyth Tech speech, as were many other themes addressed by the President on January 25. To compare the two speeches, go to the Forsyth Tech website, www.ForsythTech.edu, and click on the banner that says "President Barack Obama Visits Forsyth Tech." There you can read the December speech. Then click on the link that says "Meet Kathy Proctor." On that page is a link to the State of the Union address. Oh, and there's also a lot more information about Kathy, and her rapid rise from student to star!