EDUCATION

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INSIDE:

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Salisbury President Carolyn Ringer Lepre (front left); Makenzie Lystrup, Ph.D., NASA Goddard Space Flight Center director (front right); Michael Scott, Ph.D., dean, school of science and technology (back left); Laurie Couch, Ph.D., provost/senior vice president of academic affairs (back center); and David Pierce, NASA Wallops Flight Facility director.

From labs to launchpads

Experiential learning bolsters Maryland's STEM career pipeline

By Kate Lawless. Contributing Writer

Careers based in science, technology, engineering and mathematics, collectively known as STEM careers, may become more attractive to high school and college students in the coming years. The U.S. Bureau of Labor Statistics predicts a 10.8% growth in STEM jobs from 2022 and 2032 with a median salary that's more than double that of non-STEM roles.

To meet the demand of both students seeking STEM degrees and employers in need of STEM-educated workers, three Maryland universities are offering experiential learning opportunities to streamline the path to employment and further strengthen the STEM talent pipeline.

University of Maryland, Baltimore County (UMBC) administers the Maryland Technology Internship Program (MTIP), a state-funded program that offers financial assistance to technology-based businesses, as well as state and local agencies, to hire more interns. Since its inception in 2018, MTIP has provided over $1.5 million in matching funds to more than 200 employers, funding internships for more than 1,000 students from 30 colleges across Maryland.

Jen Spencer Heilman, program director for workforce initiatives at UMBC, notes that 94% of MTIP interns feel better prepared for their careers after completing an internship. "This hands-on experience is invaluable for students as they transition from academia to the professional world," she says. "Employers, particularly small businesses, have also seen significant benefits. These companies report that 88% of their interns have contributed to business growth."

Financial support is key for MTIP, which received an additional $700,000 this year, raising the budget to more than $1 million. This increase will allow MTIP to nearly double the number of interns it supports and increase the maximum annual reimbursement per intern from $3,000 to $5,500. "This financial assistance helps employers invest in their future workforce, fostering a stronger, dynamic tech ecosystem in Maryland," she says.

UMBC graduate Vamshi Krishna Ginna, a software developer, is completing his MTIP internship with Ardent Privacy, a data privacy company, this summer. Focusing on back end development, cloud technologies and AI, he has significantly contributed to several projects at Ardent, including designing and implementing a robust API for a new data privacy compliance tool.

"This internship provided me with invaluable back end development experience and highlighted the critical importance of data privacy in today's digital landscape," Vamshi shares. "I envision this experience leading me to roles where I can continue to innovate and contribute to cutting-edge privacy solutions."

The University of Maryland Eastern Shore (UMES) also champions experiential learning through its STEM Students Achieving Results in Science (STARS) program. UMES, a historically black university (HBCU), has awarded 60% of its degrees in STEM fields in recent years.

Through the STEM STARS scholarship program, funded by a $2.5 million Howard Hughes Medical Institute grant, 10 freshmen are selected each year to live and learn together as a cohort through their graduation. Tiara Cornelius, Ph.D., the executive director of STEM STARS, says the program aims to increase the number of students of color who pursue doctorate degrees in STEM fields.

Labs to launchpads, continued on page 7

Above: Preparing students for future employment. See article on page 2.

University of Baltimore students Farhan Aslam, Elisha Urayayi and Sean Curley talk with Dean of the Merrick School of Business, Raju Balakrishnan.

Online technology master's programs recognized nationally

Flexible degree and certificate programs for working students seeking advancement

By Lisa Baldino, Contributing Writer

Online graduate degrees from local universities are making the grade among students for convenience and flexibility. In addition, the programs are earning recognition from esteemed national organizations, like the National Security Agency (NSA) and US News & World Report.

Earning Excellence

As the cybersecurity technology market continues to evolve, the NSA is encouraging schools to work together to provide workforce-ready graduates. University of Maryland Global Campus (UMGC) met the stringent guidelines and weathered the intense curriculum scrutiny of the NSA National Center for Academic Excellence (NCAE). This qualification is required as part of the process, says Loyce Pailen, Ph.D., senior director of the center for security studies at UMGC.

"To obtain the NCAE designation, schools undergo a process that aligns with National Initiative on Cyber Education (NICE) and industry standards, and the schools maintain the program with current updates," Pailen notes.

Through the designation process, faculty members are vetted for experience and credentials in relative cybersecurity fields. Also, Pailen says, the school must show outreach to the community – that they are sharing expertise and seeking collaborative opportunities. UMGC offers Master of Science degrees in both cyber technology and in cyber management and policy, an NSA approved program of study.

Pailen acknowledges the astounding growth in the cybersecurity market, saying that approximately 500 schools nationwide have earned the NSA designation. Industry trade publication, Cyberseek, notes that there are over 460,000 cybersecurity job openings. "We work together with schools in the community to help them get the designation. It is not a competition," she says. "So much needs to be done to fill the workforce gap and to create a cybersecurity pipeline starting in K-12. The opportunities to collaborate are huge."

One of the advantages of earning the NCAE designation is the ability to offer the highly competitive DoD Cyber Scholarship Program to students applying for the cybersecurity-related curriculum. UMGC is awarded two to three scholarships per year, which pay for the student's tuition and include a considerable stipend. To fulfill a service obligation, the scholarship recipient is also guaranteed a position within the DoD upon graduation.

"Students have access to additional resources like cybersecurity labs and federally funded research, because of the school collaborations," Pailen says. "Cyber is an evolving field. Federal and industry designations help keep ahead of innovations and trends

Master's programs, continued on page 8

Ask Margit

By Margit B. Weisgal, Contributing Writer
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STARs shine

Skills valued as much as academic degrees

If you go by what is advertised on various media, you would think everyone in the world must have a college degree to accomplish anything professionally. This is a fallacy. The percentage of Americans with bachelor's degrees is approximately 35 to 37 percent. However, certificates and industry-recognized certifications are, at last, being taken into account, along with military training, and appreciated for their value.

Advocates to finally change the rules abound, and among them is Maryland's former governor, an early adopter. In 2022, Gov. Larry Hogan announced that thousands of positions in the Maryland state government would no longer require a four-year degree. More than half of the state's 38,000 positions are affected.

Opportunity@Work, a 501(c)(3), coined the term STARs – Skilled Through Alternative Routes – in 2020 and works with employers in both the public and private sectors to expand access to career opportunities for overlooked workers. After Hogan changed the requirements, he then partnered with Opportunity@Work to update job descriptions and requirements focused on the areas of technology, administration and customer service, to tap into the talent of more than one million STARs across the state in the wake of the pandemic.

"Maryland was the match that lit the fire," says Blair Corcoran de Castillo, Vice President for STARs Policy at Opportunity@Work. "That one state's decision provided impetus to more than 20 other states to adapt and change their hiring practices, focusing on skills-first hiring, accepting STARs into their ranks."

Chip Stewart is the poster child that proves STARs are worth hiring and justifies the initiative to seek out capable individuals without a degree. He started working for the State of Maryland in 2019 as the assistant state chief information security officer or CISO.

"There are multiple paths to competence," Stewart explains. "A degree is one of them, but not the only one. Alternative paths are as good as, if not better than, degree programs for what we do. If you looked at the cyber team in place back then, about half had college degrees. But if you looked at their certifications and diversity in addition to their backgrounds, you can see what led to the changes in job requirements."

Ask Margit, continued on page 8

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Tackling tough issues

Innovative liberal arts programs explore media literacy, gay rights and more

By Alex Keown, Contributing Writer

Three Maryland universities are providing innovative pathways that allow voices of disparate backgrounds to be heard. Programs at Salisbury University, University of Maryland, Baltimore County and Community College of Baltimore County are aimed at teaching students ways to highlight and elevate these voices that shape the communities around them.

In today's world where disinformation can be difficult to distinguish from factual reporting, Community College of Baltimore County's school of writing, literacy and languages is leading an initiative centered around the topic of media literacy and integrating news literacy into existing general education curriculum. The coursework primarily focuses on local news in Baltimore with a goal to heighten awareness of reliable news reporting to enable people to discern fact from fiction.

Jacqueline V. Scott, associate professor of English at Community College of Baltimore County, says the impetus for the program was rooted with the rise of "fake news" posts on various social media platforms over the past decade, as well as a misunderstanding of the difference between opinion and news.

"There was an onslaught of disinformation, a deficit of local news. All of this in combination was alarming," Scott says.

The goal of Scott's class is not only to heighten awareness of reliable sources, but also to encourage responsible citizenry among students as well as civic awareness, specifically of the first amendment and role of the press in our democracy.

Angel Marie, a former student of Scott's, says the media literacy class "opened her eyes" and pushed her to "critically assess the origins of information and to appreciate the importance of reliable news, regardless of the source's typical viewpoint." Scott's class had such an impact on Marie that she pursued a career in media. She joined the podcast "Girl School" as its social media manager. The podcast is an investigative series exploring the complexities of higher education, from the perspective of community college students.

"Media literacy is more important than ever, especially now that we're in what I like to call the 'age of misinformation.' Sometimes, finding reliable information feels like jumping through hoops, especially with the rise of AI. That course taught me how to sift through all the noise and find the truth, which is a skill that's invaluable today," Marie says.

University of Maryland, Baltimore's County's CoLab, is a four-week paid summer narrative-based research internship for students that provides them with opportunities to conduct humanities research, tell solid stories and amplify community voices.

CoLab began in 2018. Since its launch, students have completed 18 different projects with seven more going on this summer

Students work on multiple types of projects. Over the years, some of the projects have included the development of marketing materials for Baltimore Immigration Museum, a script for a traveling educational play about gardening, a digital tour of Tola's Room, a Puerto Rican home museum and cultural space in Baltimore and information for a special collections exhibit about paranormal and parapsychology publications in the UMBC library. Other projects have included the collection of stories about African American heritage in Baltimore and support for a documentary project highlighting youth groups in East Baltimore.

Students are also working on a podcast highlighting Baltimore's LGBTQ+ history by working with oral histories, interviews and archival resources. The student researchers are producing multiple podcast episodes about these histories for the nonprofit organization Baltimore Heritage, which has "always been interested in amplifying the different histories of Baltimore," Kate Drabinski, principal lecturer of gender and women's studies at UMBC says.

"It's amazing to watch what young people can do if you give them the support and time to do it. I'm always surprised by what they accomplish… they really bring their energy here," Drabinski says. "It's not just producing something for us (UMBC); it's making something for everybody. We want to make sure we have as many different voices represented as we can."

Sage Zoz, a UMBC junior, is one of the students working on the podcast. She says the podcast has "opened up the multitude of experiences that have happened and the integral ways in which queer life has shaped the history of Baltimore." Podcast episodes will cover a number of different topics important to the LGBTQ+ community, including the impact of HIV and AIDS on Baltimore, as well as an exploration of black and queer performance art in the city in the 1970s and 80s, which includes drag, ballroom dance and the theater, Zoz says.

"It's been exciting to work on this project. There's so many stories to tell but we can't tell every story – it's just not possible. You have to make an active decision on what to include and what not to include," Zoz says.

Art is taking center stage at Salisbury University. Gallery 128, formerly known as Electronic Gallery, is a more expanded, largely student-led, collaborative and experimental space, says Jayme McLellan, the new acting director of the gallery. For the past 25 years, McLellan has been working with artists and galleries across the Baltimore and Washington, D.C. region, focusing on experimental and collaborative exhibitions, projects and classes.

The current exhibition, created by New Media Art Professor David Gladden and students Jeremy Boyden, Sarah Bylan, Bryleigh Foreman and Isabel Wells, is "Conversations: Stop Motion Animation." Gladden learned stop motion animation and made the short film "Swamp Creatures" during his sabbatical last year. He then taught the stop motion technique, and software, to his New Media students, McLellan says.

McLellan is excited about the evolution of Gallery 128. When it was known as Electronic Gallery, she says it was experimental, geared toward showing electronic artwork like film, video and experimental media.

"Now it's geared toward students and faculty working in the space. We're still working out all of the components to it, but it's an exciting time for our art community," McLellan says. "This is a very meaningful approach to creative display. It opens possibilities and creative sparks in our students and supports that in an experiential way."

As Gallery 128 continues to evolve, McLellan is working on a new exhibition for the fall that will showcase the work of an artist from El Salvador. The exhibit will focus on identity and collective processing of trauma, she says.

"This is an exciting time to be at Salisbury University," she says.

Preparing students for future employment is a win-win

College graduates, their prospective employers, and Maryland's economy all benefit

Joseph Copenhaver (left), MATRIX lab manager, and Trevon Jefferson (right), "Tech Jobs Rule" apprentice

Photo: Lauren Bacon, Communications Coordinator, University of Maryland

By Carol Sorgen, Contributing Writer

University of Maryland Eastern Shore's career and technology education program, located at the Baltimore Museum of Industry, recently received approval from the State of Maryland to offer certificate programs in work-based learning and career counseling.

"The program will be the first in the state and is tied to the "Blueprint for Maryland's Future" initiative passed by the Maryland legislature," says Tyler S. Love, Ph.D., D.T.E., professor in the department of the built environment, director of graduate studies in career and technology education, and coordinator of undergraduate technology and engineering education.

Love explains that the program will help train career counselors to meet the needs of students in grades K-12 in exploring their strengths and finding career paths that fit their skills and interests, particularly including careers in the fields of STEAM (science, technology, engineering, the arts, and mathematics), which are projected to be in high demand in the future. UMES is the only program in the state with this particular certificate program that leads to teaching licensure from the Maryland State Department of Education.

"Every school-age child should have access to career counseling," says Love. "Educators who earn this certificate will be able to help students explore their interests and skills, and as they progress through school, learn about opportunities such as apprenticeships, internships, and in-person visits to statewide businesses and industries."

Most of the more than 130 students in the certificate program are currently full-time educators.

"This certificate will not only open doors for those already in the field of education but can, in turn, change the lives of their students in helping them explore their career choices for the future," says Love.

AACC Trains Students for Cybersecurity Careers

Anne Arundel Community College (AACC) is one of seven colleges nationwide – and the only community college – chosen to be part of a coalition led by Rochester Institute of Technology (RIT) to address the current and projected cybersecurity talent shortage.

The program seeks to support former military service members and first responders with transitioning into high-demand civilian cybersecurity careers. Qualifying and selected students receive funding for tuition and fees up to $5,000 and are paired with mentors to help prepare them for cybersecurity careers.

Along with RIT and AACC, the other coalition institutions chosen include University at Albany, Louisiana State University, Polytechnic University of Puerto Rico, Iowa State University, Norfolk State University and University of North Florida.

According to RIT, The Cybersecurity Maturity Model Certification (CMMC) will soon require 30,000 Department of Defense contractors to receive audits of their cybersecurity to ensure supply chain security, which will add to the growing need for cybersecurity professionals. The National Security Agency has awarded RIT's coalition $2.5 million to help fill critical roles with professionals well-suited to work in security services and support at least 250 new certifications that help place transitioning veterans and first responders in desirable professional cybersecurity roles.

"This is a great opportunity for veterans and first responders to put their previously acquired skills to work in the field of governance, risk and compliance, and learn cybersecurity foundational and technical skills," says Mary Wallingsford, associate professor in the cybersecurity, networking and digital forensics department at AACC. "We're very excited about the opportunity this will bring these students, allowing them to pivot to a rewarding and challenging new career in the cyber field."

The program features include training, mentoring, placement and certifications. Students are prepared for professional roles as IT Auditors, evaluating DoD (Department of Defense) contractor compliance with new CMMC (Cybersecurity Maturity Model) Certification. There are 25 open slots in AACC's program. The application deadline is rolling until all scholarships have been awarded.

University of Maryland's MATRIX Lab Graduates First Apprentice

Trevon Jefferson is one of the more than 40 graduating high school seniors throughout St. Mary's County who is going on to college, thanks in part to the state's "Apprenticeship Maryland" program. Jefferson, who is 17 and a recent graduate of Leonardtown High School and the Dr. James A. Forrest Career and Technology Center, will be attending the College of Southern Maryland for two years, with plans to then transfer to the University of Maryland to major in mechanical engineering. The Dr. James A. Forrest Career and Technology Center works with companies including the Patuxent Partnership (TPP) and Naval Air Warfare Center Aircraft Division (NAWCAD) on the "Tech Jobs Rule" apprenticeship program, which helps connect students like Jefferson with facilities such as the MATRIX Lab.

This past year Jefferson worked at the University of Maryland's MATRIX (Maryland Autonomous Technologies Research and eXploration) Lab through "Apprenticeship Maryland's" local unit, "Tech Jobs Rule," which connects talented St. Mary's County high school students with opportunities in STEM fields. Jefferson put his engineering skills to the test, working with Joseph Copenhaver, Research Lab Manager for the University of Maryland Clark School of Engineering at the University System of Maryland at Southern Maryland (USMSM) to build an autonomous 3D-printed aircraft.

Working at the lab gave Jefferson the opportunity to learn how to use the computer numerical control (CNC) milling machine and the water jet cutter, as well as on skills related to mechanical, electrical, and computer engineering.

"Hands-on practice is a valuable part of the education the students receive," says Copenhaver. The apprenticeships are open to rising high school seniors who spend four hours a day during the school week receiving at their on-the-job placements.

In addition to expanding his engineering skills, Jefferson had the opportunity to meet such notables as Maryland's Governor Wes Moore, as well as Secretary of the Navy Carlos Del Toro, and other members of the U.S. Cabinet. "It's been a very valuable experience," Jefferson says.

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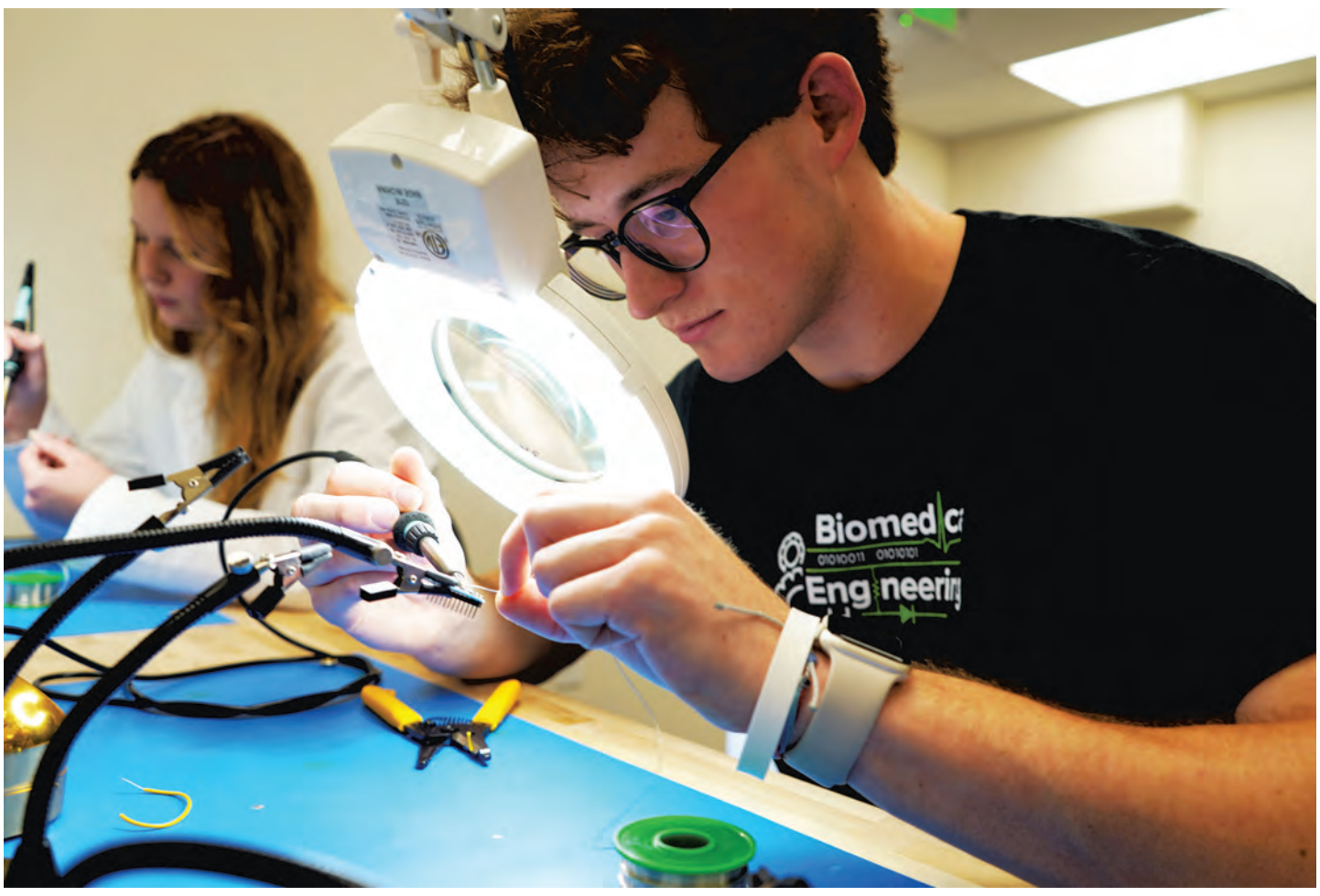


The Kahlert Foundation Makerspace at Stevenson University features a dedicated Biomedical Engineering Lab and Innovation Lab, allowing students in the Biomedical Engineering program, and from across the university, to design and create nearly anything they can imagine.

Stevenson University students work on electronics at the soldering stations in the Kahlert Foundation Makerspace's Innovation Lab.

High-tech facilities

New additions to campuses provide real-world experiences for students

By Gregory J. Alexander, Contributing Writer

Due to the buzz surrounding the Hubble Space Telescope and the SpaceX program, there has been growing interest in Salisbury University's astronomy and astrophysics program, according to Michael Scott, dean of Salisbury's Richard A. Henson School of Science and Technology. One of Scott's challenges, however, has been identifying locations near Salisbury for his students to be able to clearly see stars as part of their field work. "In the Northeast, it's challenging due to light pollution, and weather is also a factor. In order for our program to be competitive, we needed the ability for our students to stargaze and measure planetary movements," says Scott.

Luckily, starting this fall, Salisbury students will be able to do just that, thanks to the new Henson Planetarium on campus, a result of a $200,000 gift from the Richard A. Henson Foundation to support science, technology, engineering and mathematics (STEM) education.

Scott notes that there is a planetarium at a local high school nearby; however, with most of the astronomy classes at SU being held at night, there were logistical issues. "Now our students will have this amazing planetarium to perform motion calculations, predict intersections between asteroids and planets, and study red shifting, which occurs when light travels long distances, and the wavelength of the light is stretched toward the red part of the spectrum. To be able to experience this live in the planetarium space is something that cannot be duplicated in the classroom or a lab."

Scott says that Salisbury will also host stargazing parties for the local community. "Public outreach is an important and expected component in the astronomy field. Students will be tasked with teaching about star systems and communicate in a way that the general public can understand," he says.

Scott says that the unusual shape of the building will definitely generate interest when prospective students visit campus. "This new facility will help Salisbury be seen as a leader in astronomy and astrophysics," he says.

Students at Stevenson University also are benefiting from a new high-tech facility on campus – the new Kahlert Foundation Makerspace. Professor Neil Rothman, Ph.D., who is also the program coordinator of the biomedical engineering program at Stevenson, explains that the Makerspace has two components – a Biomedical Engineering Lab and an Innovation Lab.

"The Biomedical Engineering Lab will be primarily utilized by our biomedical engineering students and faculty for classes, labs and research. It was deliberately designed as a flexible space with tables on wheels, for example, in order to make the space customizable. The Innovation Lab will allow all Stevenson students to design and create items using 3D printers and collaborate together on projects," Rothman explains.

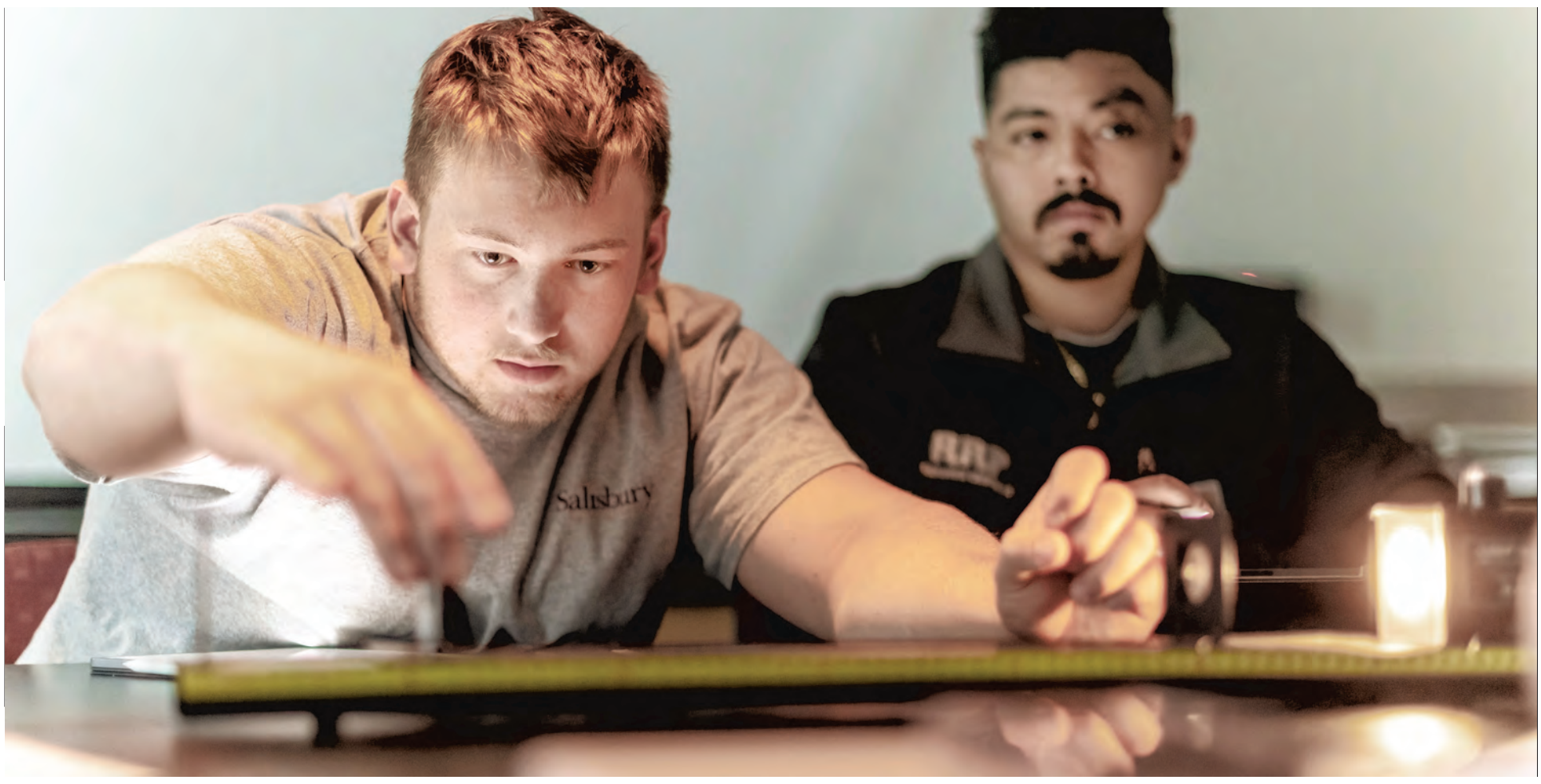
The Makerspace will have a variety of tools, including hand tools, power tools, and high-tech equipment, including 3D printers, a laser cutter, and a computer numerical control mill. "We will have equipment that any student can use with a minimal amount of training, as well as sophisticated equipment for more advanced students with more training," he notes.

"We also have meeting rooms and a lounge area for students to collaborate or just relax in between classes," Rothman says.

According to Frank J. Coale, Ph.D., assistant dean for strategic initiatives at the college of agriculture and natural resources, and a professor in the department of environmental science and technology at the University of Maryland,

High-tech facilities, continued on page 8

SPECIAL SUPPLEMENT



Salisbury University students in a Henson Science Hall laboratory.

Salisbury University Students Lay Foundation for the Future with Summer Research

SALISBURY, MD—Summer is the time for Salisbury University students to shine!

SU students do some of their best work in the summer months. Before putting on their sunglasses and sunscreen to hit the Eastern Shore beaches, they may also be found on campus, in the lab or out in the field, conducting research they are truly passionate about.

Many students are surprised not only by the opportunities they have at SU, but by their own power and potential.

English major Josey Zeunges has been spending her summer months scouring the historical archives at SU's Edward H. Nabb Research Center for Delmarva History and Culture, examining the development of creative writing and campus literary magazines. The work has given her more confidence in what she can achieve by following her passion for writing.

"I just love it here," Zeunges said. "It's incredible that we have such amazing opportunities and resources right here on campus."

Each summer, SU sponsors research projects that allow students to delve into their interests and set the foundation for their future. This year, SU summer student research projects have reached numbers not seen since before the pandemic, with 77 student projects funded by external grant and University funds. Students are assessing the impact of human activity on Assateague Island's seashores, examining how AI can assist academic writing for international students, constructing nesting for birds of prey at the Salisbury Zoo, developing a mobile app for golf swing analysis, empowering children through diverse literature and traveling to the Smithsonian Institute in Panama to conduct behavioral research on Túngara frogs.

SU is the place where students explore their passions and potential, achieving things they never imagined for themselves. Many partner with faculty mentors on groundbreaking research, author papers and present their findings at national conferences.

"My research at SU has given more opportunities than I ever could have dreamed," said Korbin Reynolds, a graduate student in SU's Master's of Applied Biology Program who will be joining his faculty mentors in the field in Panama this summer. "Being able to travel to another country, engage with a different culture and participate in research with some of the brightest minds in science is such a huge stepping block for me to pursue a Ph.D. in the future."

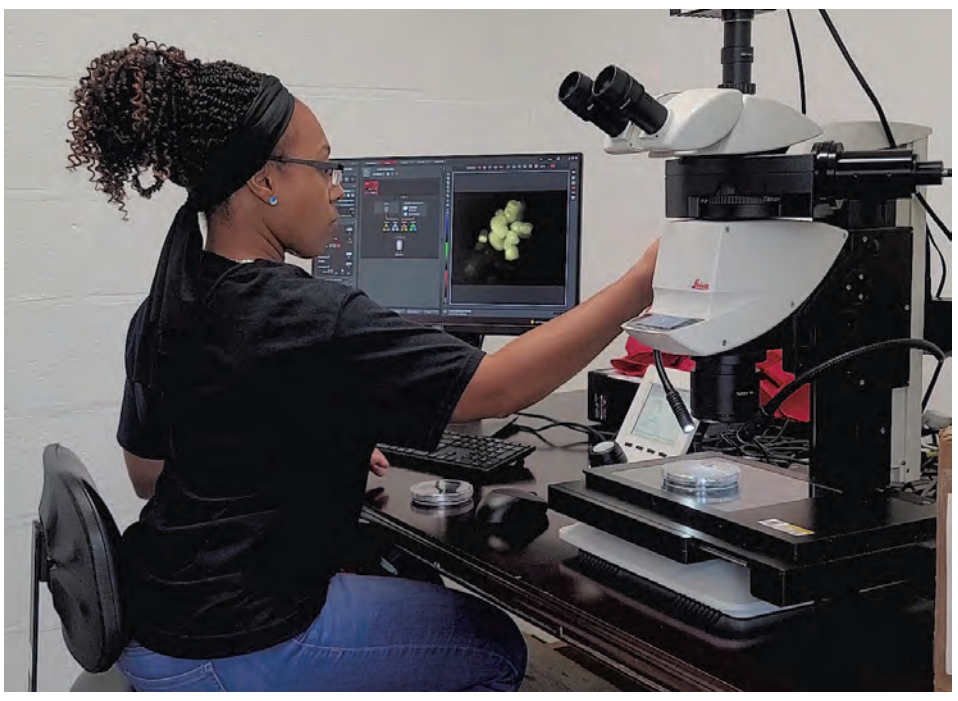
At SU, there really is something for everyone. Nationally recognized research and scholarship projects in nearly every field are funded by SU and open to both graduate students and undergraduates, far more than at most other universities.

What is special about research at SU is that students drive their own projects, based on their individual passions and goals. Expert faculty help them gain the knowledge, skills and confidence that empower them to succeed, and they carry that momentum forward to create a better future for everyone.

Lucia G. Fuentes Scott is using her research on Sor Juana Ines de la Cruz, the first great poet of Latin America, to outline a message from Sor Juana to 21st century students, especially Latinas. She hopes to start her own nonprofit in the future, so she can empower women and girls like her.

"Taking on this research has made me realize that I am capable of so much," Fuentes Scott said. "I never thought school could be a possibility for me after 32 years, but my research and the encouragement from my faculty have given me the confidence that I am able to do this and so much more."

Learn more about how SU students and graduates are making tomorrow theirs at www.salisbury.edu.



Students work in the lab on the mold and mildew on grapes project at University of Maryland Eastern Shore.

Technological pathways

Careers in research, cybersecurity and quantum computing

By E. Rose Scarff, Contributing Writer

The use of technology is prevalent in most fields today. The schools featured here give students the opportunity to gain experience using the many different types of technology while gaining other skills that will be useful to them in their careers.

The University of Maryland Eastern Shore (UMES) has partnered with Princeton University as part of the Princeton Alliance for Collaborative Research and Innovation (PACRI) for work on solutions to problems in the world today. One deals with research on coastal flooding and the other with research into mold and mildew on grapes.

Primarily focused on Baltimore's Inner Harbor, the research into the impact of storm runoff, groundwater and tides has extended to parts of the Chesapeake Bay. Students use mathematics to measure water movement and then design code for a supercomputer which does simulations and analyzes the data. "Students working on these projects then do internships at Princeton in the summer," says Meng Xia, Ph.D., professor in the department of natural sciences.

One such student is Jasmine Pinchinat, a recent marine biology graduate who worked on this project and is currently doing an internship at Princeton. She had the opportunity to learn more about and use Python, Parflow and HydroGEN and to give a presentation about her work. "Learning more about coastal hydrologic processes has really helped me understand how hydrology affects marine organisms," says Pinchinat. The opportunity to deliver her findings and perfect her outreach skills fit with her interest in environmental advocacy and education.

The research into mold and mildew on grapes is important as this has become a costly problem for vineyards here in the United States and in Europe. Currently at UMES, in collaboration with PACRI and with funding from the USDA, research has shown there are certain proteins in the grape plant that the mildew needs to grow on the plant. "If we can somehow disable the protein that is recognized by the pathogen," says Sadanand Dhekney, Ph.D., professor in the department of agriculture, food and resource sciences, "the pathogen cannot recognize the plant as a host, and it makes the plant resistant."

Students on this project do work at the cell level in labs using specialized microscopes and other equipment. Because of the long-term process of working with growing plants, students are recruited early so they can be trained in the lab processes needed for the two to three years needed for this work.

Another kind of training is offered to students in the University of Baltimore's Master of Science in cybersecurity leadership program. Developed at the request of members of the board at the Merrick School of Business, it fills the need for cybersecurity professionals who want to move into management. This is especially true for those transitioning from the military or government positions, who may not have the leadership and business perspective they might need to make the transition a success.

"So instead of focusing on technical topics," says Danielle C. Fowler, Ph.D., associate professor of information systems, "it focuses on things like risk management, leadership capabilities and analytics for business." There are also courses in decision making, ethics and law, accounting and information security management. The 30-credit program also includes a capstone experience and can be finished in as little as 18-months.

Because the program is geared toward working adults, classes are held in the evenings and online. Many of the classes that are not yet online are transitioning to that format to accommodate students who must travel for work.

Although the program has been developed for cybersecurity professionals who already have three to four years work experience, there has been interest from students who have the technical background but don't yet have the required experience. In that case, the school will encourage internships and work experience for students to act as a bridge between their technical expertise and the business side of things.

As one of the fastest growing and well-paid careers in the Baltimore area, cybersecurity leadership is not only needed in government and the military, but also in business. Whether this is biotech, manufacturing, distribution, health care or something entirely new, they will need cybersecurity professionals who can guide their company safely through the technical side of things in a leadership role.

At the University of Maryland (UMD) the new field of quantum computing is drawing students with diverse backgrounds to the study, research and development of its potential applications in its new master's program which starts this fall. Quantum computing applies the laws of quantum mechanics to simulate and solve complex problems that are too difficult for classical computing.

Beginning as a certificate program, Konstantina Trivisa, Ph.D., the director of the institute for physical science and technology, has been the force behind the initiative to create the masters offering, and to carry it through the accreditation process. The goal has been to begin training a new workforce able to utilize the power of quantum computing in a variety of fields.

The program is flexible and can be taken part-time or full-time with evening classes tailored to the working student. The seven core classes ensure students have the required background necessary, plus three electives in potential areas of application.

"Everyone wants to use the computers," says Alfredo Nava-Judela, Ph.D., director of scientific computing, "and that is one of the advantages of our program." They have direct access to one of the leaders in that type of technology so that students get hands-on experience. "They will generate code that will be actually able to run on a quantum computer and have the opportunity to explain the advantages or challenges that they faced in doing it," says Nava-Judela. This is something they can put on their resume.

Students who are already enrolled in the certificate program came with the interest to see what it could do in their current line of work. Some who work for NASA are interested in designing systems that can travel through the atmosphere in efficient ways. Those working for Verizon were interested in the networking features. Potential applications are endless and so are the opportunities.

Emma Shipley, a student in Towson's autism Ph.D. program, leads an improv class.

Advances in health care education

New programs aim to improve outcomes

By Linda L. Esterson, Contributing Writer

The COVID-19 pandemic was responsible for fueling our nation's mental health crisis. More people than ever are in need of mental health services, and the demand for professionals to provide service is at an all-time high. According to the Bureau of Labor Statistics, employment of substance abuse, behavioral disorder and mental health counselors will grow by 18% from 2022-2032, much faster than the average for all occupations. In response, the University of Maryland Global Campus (UMGC) is launching a new Master of Science degree in clinical professional counseling (MSCPC) this fall.

"The cumulative drivers for the program are anchored by the keystone, the human need for mental health and wellbeing," notes Phyllis Medina, Ph.D., professor and program director of the new master's program, via email. "The United States is experiencing an opioid epidemic and mental health crisis. Behavioral health needs have increased, the number of individuals receiving behavioral health services has not."

The program spawned from a variety of conversations, according to Medina. Local Maryland clinical professional counselors shared wait lists and wait times for services for patients. The national average wait time for behavioral health services is 48 days, Medina notes. In addition, current bachelor's program students and alumni have expressed interest in helping professions and have specifically requested a master's level clinical professional counseling program.

"The MSCPC will help with meeting student, workforce and community needs during a time in which market projections indicate there is a nationwide shortage of clinical professional counselors that has been exacerbated by increased demands for mental health and substance abuse intervention services triggered by the COVID-19 pandemic," Medina wrote.

The MSCPC focuses on the holistic development of the counselor-in-training, with the cultivation of skills for both individual and group counseling. Students will receive extensive training in foundational counseling theories and techniques, complemented by onsite clinical supervision during practicum and internship experiences. In addition, they will choose from elective courses in specific areas of interest, including Substance Use, Dependency, and Addictions; Marriage and Family Counseling; Child and Adolescent Counseling; Military Culture and Family Dynamics; Gerontological Counseling; and Sex Therapy.

"The program maintains a current and relevant academic learning environment that fosters a strong professional identity, promotes the standards of the counseling profession, and creates clinical competence across the lifespan," Medina wrote. "Students will engage in experiences that create personal and professional awareness, insight, and growth, thus enhancing students' abilities to deliver client-centered, culturally responsive, and ethically competent counseling services."

The MSCPC is designed for students seeking employment as licensed practitioners in community and business settings, including mental health centers, drug and alcohol treatment programs, correctional institutions, health care institutions, social service agencies, private practice and business and industry.

Support for people with autism is another area of focus. A new Towson University program is preparing students for careers in higher education, research and policy and advocacy related to autism. Last fall, TU welcomed the first cohort of the Doctor of Philosophy in autism studies program. Housed in the college of health professions, it is a unique program focused solely on autism and developed with an interdisciplinary approach across several university colleges and the Hussman Center for Adults with Autism in TU's Institute for Well-Being. Additional collaborations have been formed between the program and the colleges of education, liberal arts, science and mathematics, and fine arts and communication.

"It's focused solely on autism studies and not housed in one field of study like most Ph.D. programs. It really allows the field to grow by bringing people from different backgrounds with different lenses together to think about the many different issues that could be studied related to autism," says Kaitlyn Wilson, Ph.D., program chair of the doctor of philosophy in autism studies and associate professor and chair of the speech-language pathology and audiology department at Towson University. "The field of autism studies in general has grown and evolved quite a bit over the past few years, thinking about different models of disability and needing to study autism in a lot of different ways that haven't been studied before. Our program allows students to do that in a focused way."

According to the Centers for Disease Control, the prevalence of autism spectrum disorder has been higher in recent years, related to changes in its clinical definition as well as better efforts to diagnose. There's more awareness individually and in the media, with more television shows and movies highlighting autism, Wilson adds. "There are people who have significant needs, and there are people who work in the field who want to use best practices. Being able to advance those best practices in an ongoing way is so important."

The full-time, 60-credit hybrid program includes core coursework in foundations of autism, as well as research and research methods, and dissertation study, and in a secondary concentration like theater, psychology or family studies. Students complete two mentored teaching experiences, enabling them to learn about the research process from experienced researchers.

After a few teaching experiences at the undergraduate level, Emma Shipley, a student in the autism Ph.D. program, aims to work in higher education with a courseload specified to autism studies. Shipley, a speech-language pathologist, works with post-secondary students in alternate standards classrooms with high support needs after four years working at the high school level with a caseload of students with an 85% autism diagnosis. Her desired future professorship would involve teaching speech-language pathologists about autism and evidence-based interventions with autism in the realm of communication.

"My caseload is primarily autism, and I love it," Shipley says. "It all coincided with the creation of this Ph.D. program at Towson."

The results of a survey published in 2021 in Health Affairs, a journal published by health services research firm AcademyHealth, indicates that physician perceptions of people with disabilities affects their delivery of health care services. The survey reported that 82.4% of U.S. physicians feel that people with significant disability have worse quality of life than nondisabled people, and only 40.7% of physicians were confident about their ability to provide the same quality of care to patients with disability. In addition, only 56.5% strongly agreed they welcome disabled patients to their practices, and more than 18% acknowledged that the health care system often treats these patients unfairly.

In response to the lacking provision of health care services to this patient population, the University of Maryland, Baltimore School of Nursing introduced a course to prepare health care providers to better serve patients with disabilities.

"One in four to five people have a disability, and if our health care workers aren't properly trained to care for them, then they're going to not get the best of health care, which is what the University of Maryland strives to have our students give," says Rebecca N. Weston, Ed.D, M.S.N., R.N., C.N.E., assistant professor at the University of Maryland Baltimore School of Nursing at The Universities at Shady Grove.

Weston, whose son is autistic and husband is disabled following military service, created the "Exploring Disability in Health Care" course to provide comprehensive nursing education on caring for people with disabilities across the lifespan and transitions. The course is based on competencies recommended by Standards of Professional Nursing Practice, the Core Competencies on Disability for Health Care Education and The Americans with Disabilities Act, and focuses on students gaining a better understanding of the physical, cultural, spiritual and emotional needs of patients with cognitive, physical, visual and hearing disabilities.

Currently considered an elective, the course was first offered last fall. Plans are underway to expand access by spring 2025 to students attending other professional schools within the university, including the medical school, school of social work, school of dentistry and school of pharmacy. Weston also hopes it will become a required course for the school of nursing in the future.

A grant from the university has enabled a unique culmination to the course. In April, the clinical schools' simulation department, the University of Maryland schools of medicine and nursing standardized patient programs, partnered with the Maryland Special Olympics to provide a day of specialized training for nursing, social work and medical students. Four Special Olympics athletes with intellectual and developmental disabilities trained as patients, enabling interprofessional collaboration amongst the students.

"To see these health care students learn what kind of questions to ask, understand that it's appropriate to ask questions and it's appropriate to direct questions directly to the person who they're speaking to was just amazing," Weston says.

The pilot program will be offered to students semi-annually, near the conclusion of the course each semester.

Labs to launchpads, from page 1

Vamshi Krishna Ginna, a UMBC graduate and intern at Ardent Privacy, works with colleagues.

"Historically, people of color have been underrepresented in STEM disciplines," she explains. "Increasing the number of people of color with PhDs and MD-PhDs in the STEM fields will lead to more representation and diversity. When future students can see role models who look like them being successful in the STEM fields, they are more likely to view STEM careers as accessible to all."

This past year, the inaugural cohort of UMES STEM STARS scholars engaged in a number of educational programs, including a two-week research project studying the hydrologic cycle, as well as seminars, field trips and professional development workshops. In addition, the students were each paired with faculty fellows and began research projects in their respective fields.

"The first year with the inaugural cohort went extremely well," Cornelius says, adding that the STEM STARS scholars achieved major success, from being selected to present at an aerospace conference in Milan, Italy, to completing requirements for becoming a professional pilot.

Alleyah Britton, an environmental science major, interned with the UMES Geoscience Bridge program and is currently interning with the Inclusive NOAA Fisheries Internship (IN FISH) program. "Through UMES STEM STARS, I have gained valuable experiences that have supported my career goals," Britton says.

Salisbury University (SU) has strengthened its experiential learning offerings through a Space Act Agreement with NASA's Goddard Space Flight Center. The partnership enhances and builds upon ongoing aerospace education and workforce development efforts by both SU and NASA's Wallops Flight Facility, which is managed by Goddard.

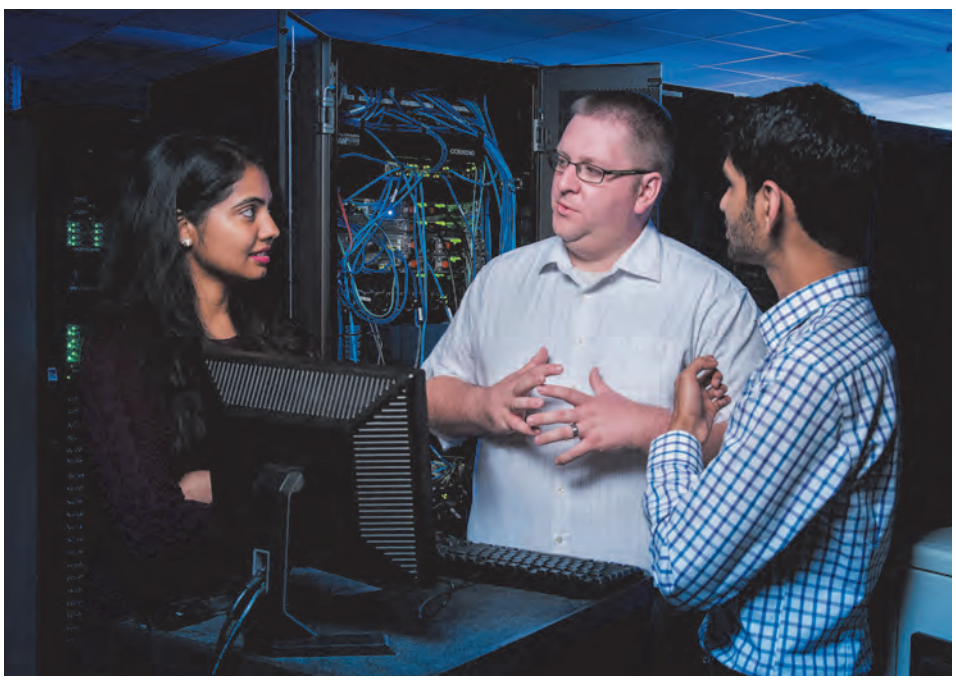
Situated on the northeast coast of Virginia, Wallops conducts upwards of 50 operational science and technology missions annually and is increasing launch operations with commercial partners like Rocket Lab. For several years, SU students and faculty have engaged in impactful projects with Wallops staff, including designing and building a ThinSat in 2021 that Wallops launched to the International Space Station to study thunderstorm impacts on the lower thermosphere's magnetic field.

Michael Scott, Ph.D., dean of SU's Richard A. Henson School of Science and Technology, says the agreement will create more internships and opportunities for students and faculty to participate in even more experiential, hands-on research and engineering projects. It also enables NASA and WFF staff to increase involvement on campus, through guest lectures and job fairs.

"In practical terms, this means a greatly expanded workforce development effort where we recruit high school students to SU specifically for the opportunities to eventually work in the aerospace industry at Wallops," Scott says. "The talent pool for the larger aerospace industry is not nearly deep nor wide enough to meet the mind-bending opportunities of the 21st century. Undergraduate STEM education is certainly one of Salisbury University's strengths and we're committed to leveraging that for the broader industry but Wallops Flight Facility in particular."

These programs at UMBC, UMES and SU exemplify the innovative approaches Maryland universities are taking to prepare students for successful STEM careers. Through hands-on learning, financial support and strong industry partnerships, these institutions are meeting the growing demand for STEM talent and ensuring graduates are ready to tackle the challenges of the future.

Masters programs, from page 1



University of Maryland engineering students meet with Professor Kevin Sivers.

like AI, virtual reality and quantum, as they intersect with cybersecurity."

Reality Ranking

The University of Maryland A. James Clark School of Engineering continues to rank among US News & World Report's top 10 public universities in graduate engineering programs. The 2024-2025 rankings placed the online master of engineering at number six, including its cybersecurity specialization.

While the university is celebrating the 30th anniversary of the Maryland Applied Graduate Engineering (MAGE) program, the cybersecurity program has been in place for 12 years, according to George Syrmos, Ph.D., assistant dean for continuing education at the school. "The on-campus and online [courses] are exactly the same," he notes. "We offer the program online so professionals can have flexibility. They can complete their coursework from anywhere."

Syrmos says the combination of theory and application makes the program successful. "The faculty is a cross-section of professional engineers and trained faculty. Our student body is diverse – international, from different backgrounds – and this creates an engaging environment in which to work. The online program will enhance skills and provide up-to-date knowledge for people who are already in the workforce."

Syrmos says that MAGE collaborated with the Maryland Cybersecurity Center as the curriculum was developed. Jonathan Katz, Ph.D., professor of computer science and faculty advisor, says the program is unique because of the engineering component. "Many cybersecurity programs focus on softer aspects of cybersecurity, such as policy or management. Our program is targeted for students interested in core technical work such as secure code development or malware analysis."

The school offers a master's degree that consists of 10 courses and a graduate certificate that requires only four courses. These can be completed full-time or part-time. Admission requirements include a Bachelor of Science in engineering or computer science or a closely related field. "It's a well-rounded experience and students can earn a certificate with a master's degree," Katz notes.

Program alumnus Ryan Kropff found that the program was everything the school said it was, and more. Kropff holds a job as a cyber incident responder, investigating potential computer intrusions and performing containment activities and digital forensics. He says he chose this particular graduate curriculum because he thought it would provide a seamless online experience and more useful hands-on skills. After completing his courses, he acknowledges, "The program met my expectations with the online learning modality and the practical nature of the courses. It helped in securing a promotion shortly after graduating."

Actual Artificial Applications

The University of Baltimore recently became the first and only business school in Maryland to offer a Master of Science degree in artificial intelligence for business. "What we talk about today in the application of AI in business may be changed in four months. We are training the next generation of business leaders to be experts in AI," says Raju Balakrishnan, dean of the Merrick School of Business at the university.

Balakrishnan says that business curriculum needs to address critical issues such as how to collect and analyze data, how to use the data to generate good AI models and then apply them to improve the bottom line, and how to protect the data through cybersecurity. The new degree is meant to fill a void that Balakrishnan sees in this model – effective application of AI in business.

"On the hardware side, they are focused on developing faster processors. On the software side, they are focused on developing better AI modules. We are focused on how businesses actually go about using AI in areas such as customer relations or R&D," he says. "People have all these AI tools available, and more are becoming available each day, but they don't always know how to use them effectively to improve the bottom line."

Balakrishnan proposed the new degree program when he joined University of Baltimore in 2023. It was immediately supported by the faculty members, and they shared a sense of urgency for the introduction. The faculty worked to create the curriculum from August 2023 to January 2024, and the program received final approval in April. It will be available to students in the fall of 2024. Qualifying students can have any undergraduate degree but must possess some basic knowledge of core business disciplines.

Balakrishnan says the curriculum also includes a course on ethical and regulatory issues. "AI can also be used to manipulate data," he says. "People need to understand how to not only use AI effectively but also recognize when it is used improperly."

The school estimates an initial class of 30 students, with roughly a 20-30% increase in the next four years. Balakrishnan notes, "We'll be growing at first, but then there will be increased competition as other schools get similar programs. It is an emerging field that's here to stay."

And that's worth recognizing.

Ask Margit, from page 1

In the 1990s, when Stewart, self-described as intellectually curious, was playing around with computers, cybersecurity wasn't a big deal. "I wondered how to use security in ways those who created the programs didn't intend. After a while, I became completely conversant with security issues, which led to figuring out how internet technology functioned. As I became more knowledgeable with different aspects of technology, each one led me to new areas I wanted to learn and understand.

"Eventually, I was hired and worked as a contractor for the State of Maryland. The chief information security officer (CISO) recommended me to be his deputy. When he left, I took over."

Another staunch supporter is Christopher M. Davis, Ph.D., who serves as the University of Maryland Global Campus's vice president of academic services and quality. "In less than a year, UMGC awarded transfer credit to 39,379 unique undergraduate students, including:

- 878,857 transfer credits awarded from previous collegiate transcripts
- 499,529 transfer credits awarded from military education transcripts
- 69,553 transfer credits awarded from non-collegiate transcripts
- 16,010 transfer credits awarded from test scores (e.g. AP, DANTES, CLEP, etc.)

"This is the equivalent of 12,200 bachelor's degrees and saved UMGC students over $465 million at the in-state tuition rate."

UMGC's history dates back to 1947 when it started offering evening classes to GIs returning from WWII. It has had different names, but its mission has remained the same. "Beginning in 1949, it was the first college to offer courses overseas for members of the armed services, sending its faculty to post-war Europe to do so. In 1959, the school was renamed University College and, in 1970, it became a separately accredited institution. UMGC was one of the founding institutions when the University System of Maryland was created in 1988," according to UMGC's website.

"Too often schools look for excuses to deny credit even from other accredited institutions. At UMGC we look for reasons to say yes," Davis says proudly.

"UMGC has always been ahead of other schools due to our engagement with military students," Davis explains. "In 2021, the Maryland Higher Education Commission passed the Transfer with Success Act which clarified ways 'to fully support transfer students and clarify statewide processes and expectations.' It helped to standardize credits so we could do more for students."

Davis observes that, too often, whether you have a degree or not is a socio-economic differentiator and discriminator. "An expectation from Gregory Fowler, Ph.D., our president, is to figure out ways to increase opportunities based on what students know and how to give them credit for that knowledge. We love our students, but we love them even more as graduates. We've partnered with organizations who help us define how much credit various learning experiences outside a formal university setting are worth. So many places provide training; we want to be able to quantify the learning to expedite completing a degree.

"Another focus is our work with the armed services. Commissioned officers need a college degree. It's surprising how few enlisted personnel have a goal of becoming an officer. We help non-commissioned officers, like sergeants, petty officers and the like, reach that goal. With one sergeant major, we were able to award him more than 60 credits for all his prior learning, over half-way to a bachelor's degree.

"Other colleges are doing some of this. From a volume perspective, we are the biggest. Our goal, though, is to be the most transfer friendly institution in the nation."

When Stewart became the CISO for the state, his position wasn't fixed, so in March 2020 there was a hearing to make it permanent. "My goal was to codify the position's description without a degree requirement. The session ended with no action. Knowing I would run into the 'paper ceiling,' the invisible barrier that comes at every turn for workers without a bachelor's degree, I enrolled in Western Governors University and completed a bachelor's and master's degrees in less than a year. The CISO position does have a degree requirement now, so I was covered. However, I also gained 10 or 12 additional certifications and I'll continue down the path of being a STAR."

Change is happening to accept more STARs, albeit slowly. Those coming up will have options that weren't available in the past. And it all depends on what you want to do with your life. Students now have more choices than ever before – and that's a good thing.

High-tech facilities, from page 4

Students test and analyze materials in the Biomedical Engineering Lab in the Kahlert Foundation Makerspace at Stevenson University.

when most people think of fermentation, they immediately think of wine, beer or cheese. "However, fermentation is much broader than that … fermentation can also include fruits, vegetables, yogurt, biofuel and biopharmaceuticals," Coale notes.

Beginning this fall, students at the University of Maryland can put their classroom knowledge to work at the brand-new Fermentation Science Lab on campus, allowing students to produce cheese, beer, wine and other fermented products while gaining the necessary skills to enter the fermentation industry in Maryland upon graduation.

"We will be focusing on the use of local, raw materials to encourage the production of local products and the skills necessary to get these products into the marketplace," says Coale. He adds that when the new Fermentation Lab was being designed, UMD brought in leaders from different fermentation industries located throughout the state to gain insight on what skills and experience they wanted graduating students to have when entering the workforce.

"What we heard was they wanted students to be utilizing equipment in our lab that is similar to what they will find in the workplace, reducing the need for significant on-the-job training. For example, we will have a small-scale brewing system similar to what you would find at a local craft brewery and a distillation unit similar to what you would find at Sagamore Spirit," says Coale, who adds that internships also provide hands-on experience for UMD students.

"Once students gain the knowledge of the science of fermentation, they can put that knowledge to work at the Fermentation Lab. For example, they can study what microorganisms make Brie cheese taste like Brie cheese or the numerous ways to alter the taste of yogurt. We want students to experiment with all the different equipment at the lab to determine what their career path will be and be exposed to all the different facets of the fermentation industry," Coale says.