2019 HI-TEC Concurrent Sessions

WEDNESDAY, July 24, 10:15-11:00

Grand Ballroom A

Building a Statewide Systems Approach to Meeting Industry Workforce Demand

It takes a village to meet the demands of industry. Yet colleges work independently as pockets of innovation trying to address growing workforce deficiencies. Learn about a different, collaborative approach that Arizona has used. Community colleges in the area had successfully implemented innovative workforce programs. However, the partners recognized that a collaborative effort was needed to meet demand. Join a panel of college leads and state government representatives as they share the steps taken to produce a uniform statewide program. The lessons learned can change the workforce training and education landscape.

   Leah Palmer, Mesa Community College, Mesa AZ; **Greg Wilson**, Pima Community College, Tucson, AZ; **Paula Livingston**, Estrella Mountain Community College, Avondale, AZ; **Julie Leonard**, Central Arizona Community College, Coolidge, AZ

Grand Ballroom B

Immuno-biotechnology and Bioinformatics in Community Colleges

The use of new technologies such as immune-profiling (where large numbers of immune receptors are sequenced en masse) and targeted cancer therapies (where researchers create, engineer, and grow modified T cells to attack tumors) is leading to job growth and a demand for new skills and knowledge in biomanufacturing, quality systems, immuno-bioinformatics, and cancer biology. In response to this new demands, Shoreline Community College (Shoreline, WA) has begun developing an immuno-biotechnology certificate. Part of this certificate includes a five-week course (30 hours hands-on computer lab) on immuno-bioinformatics.

   Sandra Porter, **Todd Smith**, Digital World Biology LLC, Seattle, WA

Grand Ballroom C

Maximizing Business Engagement to Support Your Students: Why a Regional BILT Makes Sense

The National CTC's model for actively engaging employers in steering curriculum development and guiding faculty and students keeps programs current with evolving IT technology. This approach ensures that students learn the skills they need to be "workforce ready." The National CTC is expanding this approach by mentoring seven "regional BILTs" (business and industry leadership team) across the country. Attendees will learn how they can use the National CTC's BILT model in their own regions to ensure active engagement from employers. This session will provide strategies for using the model, which can work with any technical discipline.

   Ann Beheler, National Convergence Technology Center (CTC), Frisco, TX

Grand Ballroom F

Best Practices for Teaching Student Veterans

Military veterans bring experiences that can be valuable assets to classrooms, along with others that can be barriers to success. Hearing loss, a commonly overlooked disability in the veteran population, is often one of these barriers and can have a significant impact on learning. This presentation will share results from student veteran focus groups and surveys that provide insight into the unique educational needs of these students. Attendees will learn about the student veteran's Top Ten List of ways to make classrooms more welcoming and accessible and simple Universal Design practices that benefit student veterans as well as all students in the classroom.

Donna Lange, **Hira Paulin**, DeafTEC, Rochester, NY; **Mike Sauter**, **Terence Nelson**, DeafTEC, Mission Viejo, CA

Grand Ballroom G

Detecting Stolen Identity Using Advanced Threat Analytics: Delivering Identity to the Cloud

This presentation will address the challenges of defending and detecting modern cyberattacks such as spear phishing and ransomware. Malware has evolved beyond signature-based antivirus solutions, and network attacks have moved to application and identity levels. This presentation will explore the use of advanced threat analytics to detect abnormal user behavior. Participants will walk through useful techniques and tools.

Israel Emmanuel, Century College, White Bear Lake, MN

Grand Ballroom H

Educational Raman Spectrometer Demo by Central Carolina Community College (CCCC); LASER-TEC

Visible and near-infrared spectroscopy is growing at a very fast pace in many areas, including forestry, medical, agriculture, defense, homeland security, and food safety. Raman spectroscopy applications growth has resulted in increased demand for technical talent, including technicians. This session will demo a recently developed educational Raman spectrometer developed by Wasatch Photonics. CCCC has incorporated the new spectrometer in a lab in the laser and photonics technology program. The lab is part of the advanced spectroscopy course focused on Raman spectroscopy. Session participants will learn the fundamentals, applications, and job growth of Raman spectroscopy, and witness a demonstration of a Raman spectrometer.

Gary Beasley, LASER-TEC, Lillington, NC; **Chrysanthos Panayiotou**, LASER-TEC, Fort Pierce, FL

Mills 3

Balancing Technology in the 1-to-1 Career-Tech School

What is the appropriate balance between technology and face-to-face and pen-and-paper instruction in the 21st century? What do research, best practices, and experts tell us about the changing face of learning? The presenter has eleven years of CTE experience in a 1-to-1 district using LMS such as Schoology and Blackboard.

Ryan Gilbert, Ohio Hi-Point, Bellefontaine, OH

Mills 6

Digital Curricula and Textbook for Online and Hybrid Nanotechnology Courses

Omni Nano developed the only digital curriculum and e-textbook package for instructing both high school and college nanotechnology courses. Our curricula are aligned with ASTM international standards for nanotechnology workforce education, which aim to prepare future engineers and technicians for employment in high-demand fields such as aerospace, energy, and healthcare. For maximal flexibility, our curricula are modular and support a wide range of learning environments including in-class, online/virtual, blended/hybrid, and flipped classroom models. Compatibility with popular learning management systems like Canvas and Schoology make the adoption and use of our high-quality, NGSS-aligned educational materials simple and straightforward.

Marco Curreli, Omni Nano, Los Angeles, CA

Parkview

How to Develop a Coordination Network (CN) Concept in Preparation for Submitting a Proposal

(Continued at 11:15) A CN supports the development of new collaborations to build on existing networks to advance science and technician education through communication and sharing of ideas. The compelling argument for a CN is unique, and the standard project and center proposal claims are neither applicable nor successful for CN proposals. This highly interactive session will provide the foundation for a concept paper on a proposed CN. Topics will include the definition of a CN, how to build on current activities and networks, how to determine the core team for the CN, types of membership structures, and evaluation outcomes for a CN.

Mel Cossette, National Resource Center for Materials Technology Education (MatEdU), Lynnwood, WA; **V. Celeste Carter**, National Science Foundation (NSF), Arlington, VA; **Terryll Bailey**, The Allison Group, Seattle, WA

WEDNESDAY July 24, 11:15-Noon

Grand Ballroom A

Emerging Pathways: Multi-track Experiential Curricula for Robotics in Advanced Manufacturing

The kinds of skills needed in the labor market are more diverse and changing more rapidly than ever before. Technology is more integrated, connected, and automated, requiring the workforce to be nimble. To maximize their opportunities in a time of pervasive technological change, workers must engage in lifelong learning. Recognizing these changes, CUCWD and its partners are developing four-track online curriculum pathways from high school to master's degree levels with concentrations in robotics for advanced manufacturing applications. The courses will align with industry demand and incorporate experiential labs and virtual and physical work and learning experiences that extend from apprenticeships to capstone projects.

Rebecca Hartley, **Eddie Bennett**, Center for Aviation and Automotive Technology Education Using E-Schools (CA2VES), Clemson, SC

Grand Ballroom B

Interested in Learning About Emerging Algae Technologies? ATEC Can Help

The Algae Foundation launched the Algae Technology Educational Consortium (ATEC) project, recognizing that algal production will provide a sustainable source of biomass for bio-based products, feed, fuel, and foods, creating high-quality jobs for an educated workforce. Through algal education, students learn practical applications of farming and biotechnology, developing the skills for the next generation of algal-based jobs. The consortium's goal is to develop novel educational programs to strengthen industry workforce capabilities by focusing on the skills needed to support the commercialization of algal products. Learn how this technology intersects with ATE technologies and how you can get involved.

> **Linnea Fletcher**, AC2 Bio-Link Regional ATE Center, Austin, TX; **Ira Levine**, Algae Foundation and Southern Maine University, Lewiston, MA; **Stephen Gomez**, Santa Fe Community College, Santa Fe, NM; **Matt Carr**, Principal, Green Capitol, LLC, Washington D.C.

Grand Ballroom C

Building Capacity for Institutional Transformation with Achieving the Dream and ATE

Representatives of Achieving the Dream, ATE Central, and Indian River State College will discuss capacity strategies, coaching, and learning initiative opportunities that come from joint participation in ATD and ATE and the potential for synergies between the two national networks. Participants will come away with examples that will help them better understand institutional transformation through the use of networks and will have completed a visioning exercise about their own institutions.

> **Ryan Kelsey**, Meredith Hatch, Achieving the Dream, Silver Spring, MD; **Kevin Cooper**, Regional Center for Nuclear Education & Training (RCNET), Fort Pierce State College, Fort Pierce, FL; **Rachael Bower**, ATE Central, Madison, WI

Grand Ballroom F

Using Developmental Evaluation to Improve Learning and Continuous Improvement

Del Mar College secured NSF funding to launch its Unmanned Autonomous Systems Education Consortium (UASTEC). The consortium used employer and community partner engagement to build curriculum and program credentials to meet the UAS technician workforce needs in South Texas. To track lessons learned, ensure systematic program implementation evaluation, and leverage results for continuous improvement, UASTEC employed a developmental evaluation approach. This session will examine strategies and activities required to connect developmental evaluation to program and curriculum development and sustainability efforts.

> **Phillip Davis**, **John Nelson**, Del Mar College, Corpus Christi, TX; **John Cosgrove**, **Maggie Cosgrove**, Cosgrove and Associates, LLC, St. Louis, MO

Grand Ballroom G

What Can I Do with a Drone?

This session will explore the uses of unmanned aerial vehicles (UAV) and the types of sensors that can be attached to these aircraft. Vehicle types, sizes, and uses will be explained for both multi-rotator and fixed-winged. Attached sensors of different wavelengths including visible light, near infrared, thermal infrared, and LiDAR will be discussed to show how they are used for analysis. Physical parameters such as aperture, shutter speed, and resolution will be introduced as well as mission planning.

> **Vince DiNoto**, **Rich Schultz**, National Geospatial Technology Center of Excellence (GeoTech Center), Louisville, KY

Grand Ballroom H

Leveraging Compression Planning as a Tool for Proposal Development and Conducting a Job Skills Analysis

Columbus State integrates *compression planning,* a collaborative, storyboarding process, in concept development, proposal planning, and implementation of grant projects. This tool has helped investigators from multiple disciplines at Columbus State secure funding for eleven NSF ATE projects in the last five years. This session will provide an overview of the compression planning process and demonstrate how this valuable planning tool has been used in the Logistics Engineering Technology grant projects to conduct a modified DACUM and develop project proposals. Participants will learn tactics from this approach that they can take back to improve their current and future projects.

Shane Kirby, **Scott Wegeng**, Columbus State Community College, Columbus, OH; **Bob Sompolski**, Oakton Community College, Des Plaines, IL

Mills 3

Two-Tier Vacuum Technology Learning System for Semiconductor and Nanotech Manufacturing Tech Training

This three-part session will consist of (1) an overview of the vacuum technology skills required of technicians in the nanotech and semiconductor industries and the resultant design of a two-tier vacuum technology learning system suitable for community college and technical high-school curricula as well as for incumbent worker training; (2) an overview (including live demo) of the assembled vacuum trainers and the vacuum technology content and lab activities involved in using our trainers, and (3) a review of the initial implementation of this system with community college students, high-school students, and incumbent technicians.

Robert Geer, **Abraham Michelen**, **Robert Decker**, **Stephen Stewart**, Northeast Advanced Technological Education Center (NEATEC), Albany, NY

Mills 6

New Activities for Cybersecurity Programs

This session will provide information on how to receive a series of new labs and activities to upgrade your existing cybersecurity programs. Over the last 20 years, the cybersecurity industry has matured, resulting in over 52 job roles. Many of these job roles are associated with cybersecurity governance, risk management, and compliance. These materials, developed through a partnership between CSSIA and CWW and funded by NSF, will enable your program to prepare students for these new job roles. Learn how to download the materials and attend sessions on how to implement them.

John Sands, Center for Systems Security and Information Assurance (CSSIA), Palos Hills, IL; **Corrinne Sande**, CyberWatch West (CWW), Bellingham, WA

How to Develop a Coordination Network (CN) Concept in Preparation for Submitting a Proposal

(Continued from 10:15) A CN supports the development of new collaborations to build on existing networks to advance science and technician education through communication and sharing of ideas. The compelling argument for a CN is unique, and the standard project and center proposal claims are neither applicable nor successful for CN proposals. This highly interactive session will provide the foundation for a concept paper on a proposed CN. Topics will include the definition of a CN, how to build on current activities and networks, how to determine the core team for the CN, types of membership structures, and evaluation outcomes for a CN.

Mel Cossette, National Resources Center for Materials Technology Education (MatEd), Lynnwood, WA; **V. Celeste Carter**, National Science Foundation (NSF), Arlington, VA; **Terryll Bailey**, The Allison Group, Seattle, WA

Wednesday, July 24, 1:15-2:00

Grand Ballroom A

Prove Your Worth: Demonstrating the Value of Two-Year Degrees to Employers

This session will explore two of Columbus State's innovate employer partnership models. In partnership with Honda, the college developed an earn-and-learn program that has been changing the conversation around two-year technical degrees in the Central Ohio region. The program allows manufacturing technology students to work three days a week in mentored, technical roles during the second year of an associate degree. The college has also developed an onsite delivery program with Amazon that encourages the upskilling of incumbent workers through career and technical programs.

John Sherwood, **Michell Ward**, Columbus State Community College, Columbus, OH

Grand Ballroom B

Integrating MEMS and BioMEMS Materials into STEM Curricula

The presenters will discuss how to integrate MEMS and BioMEMS materials into STEM curricula. The Support Center for Microsystems Education has two sets of free online courses available with the opportunity to obtain certification through the Association of Technology, Management, and Applied Engineering (ATMAE) after completing each set of courses.

Barbara Lopez, **Matthias Pleil**, Support Center for Microsystems Education (SCME), Albuquerque, NM; **Rock Travis**, Capital Region BOCES, Schenectady, NY

Energy Security Needs a Multidisciplinary Workforce

The U.S. Departments of Homeland Security and Energy are emphasizing what ATE Centers and industry have recognized: The energy sector is uniquely critical because it provides an enabling function across all essential infrastructure sectors, and resilient energy delivery systems require a multidisciplinary workforce that understands both cyber and physical security. ATE Centers in cybersecurity and energy education, along with the world's largest utility company, will discuss and answer questions on how they're training a 21st-century workforce that is knowledgeable in cyber and physical securities across all functions from design and installation to operation and maintenance.

Kevin Cooper, Regional Center for Nuclear Education and Training (RCNET), Fort Pierce, FL; **John Sands**, Center for Systems Security and Information Assurance (CSSIA), Palos Hills, IL; **James Auld**, NextEra Energy Resource, Juno Beach, FL; **Benjamin Reid**; Impact Allies, Inc., Ennis, TX

AWS Academy: Quick Launch Cloud Computing Program

As cloud technologies continue to help organizations transform their businesses at a rapid pace, people with the necessary cloud skills are in high demand. This gap in skills creates an opportunity for educational institutions to create courses and programs in cloud computing. This session will provide information on how the AWS Academy is working to solve this problem. AWS Academy enables diverse education institutions to deliver curriculum and hands-on learning experiences to prepare students for employment in cloud roles.

Ernest Friend, Florida State College, Jacksonville, FL

Cost-Effective Augmented and Virtual Realty in the Classroom: Hands-On with Mobile Devices

Augmented and virtual reality (AVR) helps people learn faster, decide better, and remember longer. However, using this exciting new technology in the classroom has been challenging due to the need for expensive hardware and the cost to create content. ATEEC will present two cost-effective methods that bring AVR to the classroom using mobile devices, and will share content developed for an NSF grant to help students and trainees in the water/wastewater areas. Attendees will experience AVR educational and training modules using mobile devices provided.

Linda Baxley, **Josh Webb**, Advanced Technology Environmental Education Center (ATEEC), Davenport, IA

Utilization of Undergraduate Research to Increase Success in STEM Students

Undergraduate research was utilized at Pasadena City College as a method of recruitment and retention of STEM students. The program emphasizes support for students from underrepresented communities. A description of the program will be provided and a student panel will share their undergraduate research experiences.

Jared Ashcroft, **Paula Kirya**, **Zekaria Beshir**, **Tracee Maxell**, **Kellie Eugenio**, Pasadena City College, Pasadena, CA

Mills 3

Active Learning Recitation Hours in Engineering: Improving Self-Efficacy, Retention, and Success

We will share Year-2 student success results from our NSF-funded work in adding near-peer-led recitation hours in engineering courses at Valencia. Participants will see examples of active learning exercises for engineering coursework and will participate in active learning exercises.

Lisa Macon, **Mohua Kar**, Valencia College, Orlando, FL

Mills 6

Enhancing Biotech and Advanced Manufacturing Programs by Infusing Cutting-Edge Laser and Optics Curricula

Attend this session to learn how to infuse the latest laser technologies and concepts into your STEM curriculum. The presenters will provide an overview of laser applications in biotech and advanced manufacturing, from detecting and diagnosing disease to fabricating, cutting, welding, drilling, and micro machining. Technicians of all stripes are using lasers and therefore require an understanding of how they work. Participants will be given access to LASER-TEC's educational materials. The session will include a hands-on demonstration of the Light and Optics Exploration kit and will provide an opportunity to discuss methods for integrating these new technologies into existing programs.

Chrysanthos Panayiotou, LASER-TEC, Fort Pierce, FL; **Gary Beasley**, LASER-TEC, Lillington, NC

Parkview

Adapting Emerging Technology Education to the Needs of Underrepresented Minorities (URMs)

Reaching out to underrepresented minorities (URM) and developing partnerships with agencies or programs with a URM focus require educators to address the cultural relevance of their curriculum and course materials. Experiences gained through partnering with the Spanish speaking community and the Arizona SciTECH Foundation will highlight the importance and potential of engaging URMs in emerging technology education by addressing language and culture in our design of materials and curriculum. Access to the materials created by Nano-Link as well as templates for customizing curriculum for URMs will be provided and explained.

Billie Copley, Nano-Link Center for Nanotechnology Education (Nano-Link), Rosemount, MN; **Kim Grady**, BehaveHeuristics, LLC, Apache Junction, AZ

Grand Ballroom A

An Out-of-This-World Collaboration: NASA, the International Space Station, DMACC, and LSCBI

The National Community College Aerospace Scholars (NCAS) program provides educational experiences at NASA centers for community college students majoring in STEM disciplines. In 2016, NASA requested proposals from NCAS students describing potential International Space Station (ISS) experiments. Lyndsay Baker, a DMACC student, proposed to investigate microgravity effects on astaxanthin production by the microalga *Haematococcus pluvialis*. NASA expanded this collaboration when they extended an invitation for the Lone Star College Biotechnology Institute (LSCBI) to participate in "Algae Mission Control" duties. This unique undergraduate research project has generated high-level student engagement at community colleges in Texas and Iowa.

> **Daniel Kainer**, Lone Star College, Conroe, TX; **Alicia Baturoni Cortez**, NASA Community College Aerospace Scholars Manager, Houston, TX; **Lyndsay Baker**, Des Moines Area Community College, Des Moines, IA; **John Lauber**, Boeing, Houston, TX

Grand Ballroom B

How You Can Get Involved in Helping to Update National IT Industry Skill Standards

The "IT Skill Standards 2020 and Beyond" NSF project will create a set of employer-led, future-facing, and verified IT skill standards for 8–10 high-demand job clusters. Educators will use skill standards to create relevant curriculum to prepare students to meet employers' job requirements. Hundreds of employers and community college educators from across the nation will identify essential skills in top IT job clusters. Learn more about this important project, including how faculty and employers can get involved and stay updated on its progress.

> **Ann Beheler**, National Convergence Technology Center (CTC), Frisco, TX

Grand Ballroom C

Free Tools for Recruiting, Training, and Retaining the Next Generation of Cybersecurity Professionals

According to (ISC)[2], 1.8 million cybersecurity jobs will be available by 2022. Filling this gap would require hiring 63 qualified cybersecurity professionals every hour between 2019 and 2022. But how do organizations adequately find and train the next generation of cybersecurity professionals? CISA's cybersecurity outreach efforts and free resources can help you recruit, educate, and retain qualified professionals. Join this discussion on how CISA is focusing on workforce diversity and best practices for serving underrepresented groups such as women, persons with disabilities, persons of color, and veterans.

> **Nancy Limauro**, Department of Homeland Security, Cybersecurity and Infrastructure Security Agency, Washington, DC

Apprenticeship-Based Pathways Engage and Equip Underserved Populations for STEM Occupations

According to a 2014 American College Testing report, underserved populations—veterans, women, first-generation college students, people with disabilities, and students of color—have the same level of interest in STEM careers as non-underserved populations yet consistently show lower readiness rates. To increase students' technical readiness for technician-level STEM careers and credential attainment, educators and employers are turning to apprenticeships. Apprenticeship programs for technician careers provides students with valuable hands-on workplace experience, related technical instruction that can lead to educational and industry credential attainment, and guided mentoring.

Barbara Murray, TransPORTs, Morgan City, LA; **Guy St. John**, Oceaneering International, Chesapeake, VA; **Kaylene Smith**, Ivy Tech Community College Northeast, Ft. Wayne, IN; **Christina Robinson**, Houston Community College, Houston, TX; **Lauren Sugerman**, Chicago Women in Trades, Chicago, IL

Web-Based Visualization and Simulation Tools for Nanotechnology Education

The purpose of our presentation is to discuss the use of various web-based visualization and free online simulation tools for nanotechnology education. These tools can be employed to enhance students' understanding of abstract nanoscience concepts without requiring expensive equipment. These tools include 21 remote access instruments in nanotechnology (RAIN) nodes for accessing visualization instruments. In addition, over 500 simulation tools are available through nanoHUB, which enables students to simulate, learn and explore nanotechnology-related areas.

Ahmed S. Khan, Fulbright Specialist Scholar (2017-2020), World Learning, Washington, DC; **Salahuddin Qazi**, SUNY Polytechnic Institute, Utica, NY

Using Solidworks to Visualize MEMS Design Concepts

This presentation will focus on the use of Solidworks in the design and visualization of micro electromechanical systems (MEMS) devices. Attendees will learn about a Solidworks model of the SCME pressure sensor that is derived from the mask used in the construction of the devices. The model allows for the device to be viewed in different orientations to help the student understand the construction. Also, three 3D printable unit cell models of the BCC, FCC, and HCC crystalline structures will be presented with the models made available. These models can be 3D printed and contain additional support between atoms.

Andrew Bell, Ivy Tech Community College, Fort Wayne, IN

Student Engagement Through Active Learning Strategies

Have you heard about active learning? Do you want to know more about strategies that encourage student participation in your classroom? Attend this session to examine the flipped classroom, project-based learning, and other strategies for engaging students. The presenters will provide examples used in their own classrooms, show how they were developed, and share successes. You will leave with tips and free resources that will help you implement multiple active learning strategies in your classes.

Jim Sullivan, **Rachael Tipton**, Skilled Workers Get Jobs, Asheville, NC

Laser Applications in the Fields of Science, Entertainment, Military, and Information

This session will focus on current and emerging laser applications in multiple fields. Attendees will explore the use of lasers for fusion at the National Ignition Facility at Lawrence Livermore National Laboratory and for space communications at the National Institute of Information and Communications Technology. Topics will include laser light shows and laser movie magic, JDAMs (joint direct attack munitions) and EXACTO (accuracy tasked ordinance), how fiber optics communications work, and how to store a world of knowledge in a 1 cm cube using optical data storage.

Frank Reed, Midwest Photonics Education Center (MPEC), Ottumwa, IA

Get the Word Out: Outreach Tips and Tricks from the ATE Community

Join a group of ATE community experts and learn about tools, resources, pathways, and strategies that will help you share your work, connect with new audiences, and broaden your outreach and impact. Whether you're a seasoned expert or considering applying for an ATE grant, this session will help you discover new and interesting ways to plan for outreach. During our time together, panelists from ATE projects and centers that offer resources and support for educators and staff will lead roundtable discussions and share resources and tools for managing, disseminating, and getting the word out about your valuable resources and activities. Participants will select three roundtables to join to learn about newsletters, publications, teaching technicians.org, Twitter, Facebook, videos, webinars, outreach planning, and lots more.

Rachael Bower, ATE Central, Madison, WI; **Marilyn Barger**, Florida Advanced Technological Education Center (FLATE), Tampa, FL; **Mary Slowinski**, Working Partners Project, Bellevue, WA; **Mike Lesiecki**, Luka Partners, Phoenix, AZ; **Rick Roberts**, South Carolina Advanced Technological Education Center (SCATE); Florence, SC; **Anthony Manupelli**, Pellet Media, Inc, Reading, MA; **Emma Perk**, EvaluATE, Kalamazoo, MI

Wednesday July 24, 3:45-4:30

Looking to the Future: What's ATE Doing Down on the Farm?

Like all business and industry sectors, agriculture is changing rapidly. From the integration of drones and autonomous vehicles; advances in plant and agricultural sciences; and advanced automated processing, production, and testing, farms are implementing 21st-century technologies in all phases of food production. Representatives of ATE projects will share the state of agriculture and ag education in a lively panel discussion. You will be excited and surprised to learn what ATE is doing "down on the farm."

Marilyn Barger, Florida Advanced Technological Education Center (FLATE), Tampa, FL; **Amanda Sizemore**, St. Charles Community College, St. Charles, MO; **Joel Sikkema**, Dordt College, Sioux Center, IA; **Doug Laven**, South Central College, Mankato, MN

Grand Ballroom B

NBC2 Curriculum Modules: Open Educational Resources for Current Technologies in Bioprocessing

The Northeast Biomanufacturing Center and Collaborative (NBC2) is committed to developing curriculum and professional development for the education and training of technicians for the biopharmaceutical industry. A series of three-day workshops on current and emerging areas of biomanufacturing provided faculty with the hands-on experience, knowledge, and teaching materials to incorporate the topic into existing courses and programs. These workshops have resulted in seven all-inclusive curriculum modules, available as open educational resources and downloadable from the NBC2 website (biomanufacturing.org). Several modules will be showcased and implementation strategies discussed.

Maggie Bryans, **Bill Woodruff**, Northeast Biomanufacturing Center and Collaborative (NBC2), Blue Bell, PA

Grand Ballroom C

Community College Cyber Pilot Program

This session will provide an overview and first-year results from the institutions participating in the Community College Cyber Pilot (C3P) program, created to prepare students for employment with federal agencies in cybersecurity. Learn about the student benefits, curriculum pathways, and job opportunities available to participants in this program. For the first time, this pilot program enables community colleges to receive direct funding from the National Science Foundation to participate in the CyberCorps scholarship for service program. Panelists will share their curriculum pathways, student activities, and program experiences.

Michael Qaissaunee, **John Sands**, Center for Systems Security and Information Assurance (CSSIA), Palos Hills, IL; **Kyle Jones**, Sinclair Community College, Dayton, OH; **Corrinne Sande**, CyberWatch West (CWW), Bellingham, WA; **Kim Muschalek**, San Antonio College, San Antonio, TX

Grand Ballroom F

Growing Employability Skills in High-Tech Fields

Through a two-year case study and review of research, SRI Education has compiled a collection of practices that high-tech educators can use to develop employability skills such as collaboration, communication, lifelong learning, and reliability. In this session, you will learn about new instructional approaches and deepen your understanding of the important role that technical educators play in developing such skills: People are hired based on technical skills but fired based on employability skills. You will hear cases of how the development of employability skills risks getting sidetracked or stalled through lack of support or persistent life stress. You will review and discuss systematic approaches to developing employability skills from secondary school through adulthood. The goal of this session is to empower high-tech educators to take an intentional approach to developing employability skills to help ensure their students' future success and social mobility.

Louise Yarnall, SRI Education, Menlo Park, CA; **Ann Beheler**, National Convergence Technology Center (CTC), Frisco, TX

Grand Ballroom G

Enter the Matrix: Building a Rubric for Measuring Industry Partnerships and Their Impacts

Building and maintaining productive industry partnerships is key to the success of many programs, projects, and centers, yet recording and measuring the impact of these relationships can be challenging. Recognizing that few tools exist to capture such data, the NSF ATE Working Partners Research Project and The Rucks Group are working together to develop a partnership rubric for measuring these complex connections. This interactive session will introduce the rubric, facilitate audience feedback and input regarding its design and use, and provide information on how to stay involved as the matrix evolves.

    Mary Slowinski, Working Partners Research Project, Bellevue, WA; **Rachael Bower**, Working Partners Research Project; Madison, WI; **Lana Rucks**, The Rucks Group, Dayton, OH

Grand Ballroom H

Zero to Sixty in Two Seconds: Electric Vehicle Design, Fabrication, and Testing

Electric vehicles are expanding into the marketplace as never before. The presenter will provide information on how battery and motor technologies are being used in alternative energy and electronics engineering technology programs. Facility and tool requirements for both fabrication and testing laboratories will be addressed. Attendees will learn about outcomes such as a Smart Car EV conversion and an electric drag bike capable of accelerating to 60 MPH in just over two seconds.

    Thomas Henderson, Tulsa Community College, Tulsa, OK

Mills 3

AMTEC: Proven Solutions for Combating Skilled Labor Shortages

Fill your skills gap with AMTEC! Learn how AMTEC, the Advanced Manufacturing Technical Education Collaboration, can help you produce highly skilled maintenance technicians who predict, prevent, troubleshoot, and problem-solve in real time. AMTEC's employer-driven, multi-state collaboration of 70+ industry and educational partners provides a nationally recognized training solution that can lead to improved processes, reduced operational costs, and greater efficiency and productivity. This session will provide examples of industry-education partnerships that produce workers with the technical and critical-thinking skills necessary to analyze issues, solve difficult or complex problems, and manage output.

    Jason Simon, **Sheri Plain**, Advanced Manufacturing Technical Education Collaborative (AMTEC), Owensboro, KY

Mills 6

Teaching the Internet of Things (IoT): Where Does It Fit?

This session will discuss the rapidly evolving Internet-based application that many believe will be the next significant technology revolution—the Internet of Things (IoT). Applications of IoT combined with the emerging technology of machine learning and/or artificial intelligence (AI) have the potential to significantly impact almost every aspect of human endeavor and commerce. Because IoT is interdisciplinary, it will necessitate changes in how we educate two-year college students in traditional electronics/computer/networking programs, as well as what should be taught in other non-electronics-based technology programs.

    Gary Mullett, Springfield Technical Community College, Springfield, MA

Parkview

NSF ATE Grant Funding: Opportunities Abound and Mentor-Connect Provides Proposal Development Help

The National Science Foundation-funded Mentor-Connect project is a proven strategy for helping you prepare competitive proposals whether you are seeking a small grant for institutions new to ATE, reworking a first or second proposal that did not get funded, or wanting to move up to a larger project proposal. Participants will learn from NSF's lead ATE Program Officer about available funding and, from Mentor-Connect, will learn about free mentoring and technical assistance focused on proposal preparation and leadership development. To date, 90 percent of the 143 participating colleges have submitted proposals. The funding rate for proposals from Mentor-Connect colleges is 70 percent.

Elaine Craft, SC ATE, Florence, Florence, SC; **V. Celeste Carter**, National Science Foundation, Arlington, VA

THURSDAY, July 25, 8:15-9:00

Grand Ballroom A

Creating Effective Professional Development Activities

Learn successful strategies for creating professional development activities. Consider these questions: Who is your audience? What is the purpose of the activity? How do you inform and recruit participants? What do participants need to know? How do you engage participants? How do you know if the activity was effective?

Greg Kepner, **Frank Reed**, Midwest Photonics Education Center (MPEC), Ottumwa, IA; **Chrysanthos Panayiotou**, LASER-TEC, Fort Pierce, FL; **Anca Sala**, Baker College, Flint, MI

Grand Ballroom B

Inclusion Promotes Innovation: Infusing Accessibility into Next Generation Learning Environments

We know from experience and neuroscience that individuals learn in varied ways. Universal Design for Learning (UDL) provides educators with practical strategies and techniques to ensure that all learners can meet high expectations. In this session, we will explore the foundational concepts of UDL as one component of an inclusive learning environment—the other two being the universal design of the physical space and the accessibility of the learning tools and materials. The discussion will include demonstrations of a number of new tools for making STEM content accessible for a variety of learners.

Luis Perez, National Center on Accessible Educational Materials, St. Petersburg, FL; **Rachael Bower**, AccessATE, Madison, WI

Grand Ballroom C

The Necessary Skills Now Network: Enhancing Employability Skills Across Disciplines

The Necessary Skills Now Network is dedicated to facilitating collaboration between educators and employers to improve the employability skills of entry-level technicians in STEM fields. Learn more about this ATE Coordination Network and how you can participate and benefit. We'll share no-cost instructional resources and professional development activities and provide you the opportunity to interact with employers about the employability skill deficiencies they're seeing among new hires. Learn about the network's collaborative strategies for tackling these challenges.

Hope Cotner, Center for Occupational Research and Development (CORD), Waco, TX; **Marilyn Barger**, Florida Advanced Technological Education Center (FLATE), Tampa, FL; **Ann Beheler**, National Convergence Technology Center (CTC), Frisco, TX

Grand Ballroom F

Transitioning Veterans to Engineering Related Careers

The American Society for Engineering Education (ASEE), with support from the National Science Foundation, held a Veterans Summit that resulted in a dozen recommendations on ways to smooth veterans' transition from military service to careers in engineering and related fields. The role of community colleges emerged as an important potential pathway for enabling veterans to secure credentials as engineering technicians and advance to a bachelor's-level education. This session will provide a forum for sharing information and engaging community colleges to form a network to offer the model AAS degree engineering technology program recommended at the summit.

Ashok Agrawal, American Society of Engineering Education, Washington, DC

Grand Ballroom G

Classroom in the Cloud Using Amazon AWS Cloud-Based Services and Virtual Machine (VM) Environment

Suffolk Community College, in collaboration with CDW and Amazon AWS, implements a scalable, cloud hosted, virtual environment where students have 24/7 access to a multiplatform architecture that enables them to design, configure, deploy, install, and run multiple copies or instances of the same or different operating systems and application suites on a single network and virtual environment. The virtual environment is where students and faculty can implement and interconnect a network of virtual machines that is truly independent of the college's IT network.

Pete Maritato, **Steven Clark**, **Jonathan Sadowski**, Suffolk County Community College, Selden, NY

Pathways into Medical Device Networking and Cybersecurity for Biomedical Engineering Technicians

Participants will receive teaching resources (e.g., questions, videos, and activities) related to medical device networking and cybersecurity, copies of two new course outlines, and documentation for a newly developed certificate in medical device networking and cybersecurity. As healthcare technology shifts, the education and credentialing of medical equipment repair technicians, also known as biomedical equipment technicians, must be evaluated based on updated input and feedback from industry professionals. This presentation will discuss feedback collected from industry on skills and competencies needed in medical device networking and cybersecurity. This feedback was used to develop two courses and a new certificate.

Brian Bell, **Laura Malave**, St. Petersburg College, Tarpon Springs, FL

The Circle of the Center: Outreach, Programs, and Research Can Strengthen Each Other

At the Center for Plant and Life Sciences Campus of St. Louis Community College, numerous efforts synergistically overlap. These intersections produce highly valuable interactions and experiences that promote the biotechnology industry and career opportunities in the St. Louis region. The center is truly synergistic with the contract research, outreach, and STLCC programs tightly intertwined. The presenters will share the unique combination of in-depth STEM outreach efforts and high school independent research opportunities onsite at their facility.

Elizabeth (Betsy) Boedeker, **Lee Douangkeomany**, St. Louis Community College Center for Plant and Life Sciences, St. Louis, MO

Remote Delivery of Hands-on Networking Courses Using Zoom

North Arkansas College is increasing opportunities for students in rural areas by using Zoom technology and other tools to provide synchronous access to IT/networking classes being taught on the main campus. Additional supports at the remote site include lab assistants, dedicated equipment, and virtual labs. The presenters will share the details of the technology, equipment, costs, what is working, what needs improvement, and future plans for expansion.

Rick Williams, **Laura Berry**, North Arkansas College, Harrison, AR

THURSDAY, July 25, 9:15-10:00

Grand Ballroom A

Development of the Cybersecurity Workforce: The Palo Alto Networks Cybersecurity Academy

Focusing on the unprecedented demand for trained and certified personnel in cybersecurity, this session will provide attendees with information about, and the benefits of, becoming a Palo Alto Networks Cybersecurity Academy. The program provides technology and curriculum (aligned to the U.S. National Initiative for Cybersecurity Education or NICE framework and work roles) at no cost to any degree-granting institution of higher education. Come learn about the academy from an industry and faculty perspective.

J.B. Groves III, Wharton County Junior College, Richmond, TX; **Kim Yohannan**, Palo Alto Networks, Cybersecurity Academy, Cape Cod, MA

Grand Ballroom B

Strategies for Advancing Technician Education at Two-Year College Hispanic Serving Institutions (HSI)

Already serving 56 percent of Latin(x) postsecondary students, and rapidly growing in number, two-year-college HSIs can now access help in addressing the opportunities and challenges facing advanced technological education programs. The HSI ATE Hub collaborative has served 48 two-year college HSIs and is now prepared to provide specialized assistance for ATE grant proposal development and support for HSIs as the drivers of their communities' economic success via technician education. Science-Foundation Arizona's Kickstarter project and the ATE Program's Mentor-Connect project, based at Florence-Darlington Technical College, are offering mentoring and curated resources designed to improve the success and increase the capacity of two-year college HSIs.

Elaine Craft, SC ATE, Florence, SC; **Anita Grierson**, SFAz Center for STEM at ASU, Scottsdale, AZ

Grand Ballroom C

A Leap to the Future: Creating Sustainable Advanced Manufacturing Technician Unified Pathways

NextFlex, in collaboration with Evergreen Valley College and multiple industry partners, has created a comprehensive advanced manufacturing talent framework that links students in middle school and high school with an industry-driven advanced manufacturing technician program composed of stackable certificates. The program supports a broad range of competencies in 21st-century advanced manufacturing.

Brynt Parmeter, **Emily McGrath**, NextFlex, Manufacturing USA, San Jose, CA

Collaboration Delivers Third-Party Certification for Entry-Level Electronics/Instrumentation Careers

This session will provide an overview of the joint efforts of Mississippi Gulf Coast Community College (MGCCC) and the Electronics Technicians Association International (ETA) to develop a technical skills assessment (TSA) for the college's Systems Based Electronics/Instrumentation curriculum standards, which are mandated by the state of Mississippi. The intent is to lay a foundation of the skills (in a wide variety of electronics industries) needed by technical personnel to advance their career competency and efficiency. Interaction with companies demonstrating a demand for certified technical professionals and the elements of ETA credentials that make MGCCC graduates competitive in the marketplace will be discussed.

Mike Taylor, ETA International, Greencastle, IN; **Joe Poelma**, **Aaron Cleveland**, Mississippi Gulf Coast Community College, Gautier, MS

DevSecOps = DevOps + Secure Coding

DevOps is a software development methodology that combines development life cycle with IT operations. The idea is to develop faster and quicker updates using agile and lean approaches in the software development life cycle (SDLC). This process still does not solve the issue of software vulnerabilities. By integrating a security development mindset from the beginning of the SDLC, DevSecOps seeks to develop secure system design and reduce the risk of software vulnerabilities. How do we incorporate such tools in the classroom? This presentation is based on best practices on how basic secure coding concepts and agile software development are included in the curriculum.

Rajiv Malkan, **Bruce Caraway**, Lone Star College, Conroe, TX

Reaching the Most Students with Skills Information

Creating materials that enable students to learn concepts is a time-consuming (but important) process. Concepts are the foundation of learning and can be used as an introduction to new material and a review of technical knowledge. The GeoTech Center model uses short video discussions, which are placed in an online video service and closed-captioned. While voice recognition software has improved, it still requires manual editing of the text to ensure accuracy. The topics of the GeoTech Center concept modules were selected based on a personal assessment instrument. This presentation will explore the methods used to construct and disseminate the information.

Ann Johnson, **Vince DiNoto**, National Geospatial Technology Center of Excellence (GeoTech), Louisville, KY

Integrated Efforts for Promoting Broader Impacts in the NSF ATE Community Through ARIS

The NSF Center for Advancing Research Impact in Society (ARIS) will advance the rigor, relevance, and practice of broader impacts (BI) by (a) cultivating and strengthening the existing and emerging BI expert community; (b) building the capacity of researchers and educators to enhance and articulate the BI of their work; and (c) creating a socio-technical infrastructure that is adaptable to stakeholder needs. ARIS will provide opportunities to integrate BI efforts into NSF ATE projects to increase public understanding and meet the demand for innovative BI training. The center emphasizes support for serving historically underserved populations while providing inclusive public engagement to ensure a diverse STEM workforce.

Thomas Tubon, Madison Area Technical College, Madison, WI

K-12 Teacher Engagement: Successful Outreach Approaches

One focus of NEATEC is to increase student interest in pursuing educational pathways leading to careers in nanotechnology. At the K-12 level, we try to make connections with educators that will encourage them to introduce their students to this exciting field. In this session, we will cover several types of outreach that we have found to be successful, including activities that can take place at ATE centers or off-site at the home districts of the educators.

Mary Ann Nickloy, **Kelly Fahrenkopf**, **Elaine Garrett**, Northeast Advanced Technological Education Center (NEATEC), Albany, NY

THURSDAY, July 25, 10:30-11:15

Addressing the Need for Manufacturing Technology Instructors

With an estimated need for 35,000 new skilled workers in Connecticut over the next two decades, there is a high demand not only for students but also for instructors in manufacturing technology programs. To address this growing need, a coalition of educators, employers, and industry associations came together to conduct a survey of retired manufacturing employees regarding their interest in becoming instructors. The survey resulted in recommendations that will be shared during this session along with the results of instructor recruitment and professional development for higher education initiatives that have been developed and implemented.

Karen Wosczyna-Birch, **Wendy Robicheau**, Regional Center for Next Generation Manufacturing, (RCNGM), Farmington, CT; **John Birch**, Engineering Technology Challenge, Farmington, CT; **Eric Flynn**, Gateway Community College, New Haven, CT; **Mehrdad Faezi**, Manchester Community College, Manchester, CT

Grand Ballroom B

Prioritizing Diversity and Inclusion: Building a Bridge to STEM Education and Employment

Now in its tenth year, the Merritt College Bioscience program has established itself as a Bay Area leader in diversity and inclusion in STEM education and career training by creating a departmental culture that supports both men and women students from all races, ages, and stages in their education and careers. This interactive session will include lessons learned and practical tools that have brought us continued success in the areas of diversity and inclusion.

Feather Ives, **Gisele Giorgi**, Merritt College, Oakland, CA

Grand Ballroom C

Industry Talks: The Future of Work and Its Impact on the Technician Workforce

This panel will engage community college, university, and high school educators and administrators in a discussion of the Future of Work at the Human Technology Interface. Panelists from multiple business sectors will present what new technologies their companies are implementing (or planning to implement) to address the impact of these changes on technician education.

Marilyn Barger, Florida Advanced Technological Education Center (FLATE), Tampa, FL; **Richard Gilbert**, University of South Florida, Tampa, FL; **Ann-Claire Anderson**, Center for Occupational Research and Development (CORD), Waco, TX

Grand Ballroom F

Developing New Industry Standards Starting from Scratch

Northwest Engineering and Vehicle Technology Exchange (NEVTEX) (NSF ATE award #1700708) proposes to take a 140-year-old automotive industry with proven technology and technician standards and start all over again. The presenters propose the development of Advanced Vehicle Training Standards for technicians working with high-voltage and high-pressure systems. Topics will include the process of creating a template for vehicle electrification systems standards, categories for vehicle electrification systems, category sub-systems for vehicle electrification systems, and application and practical test lab examples. Many HI-TEC attendees are considering new technologies at their institutions. This is a great time to discuss the standards setting process for a new technology.

Ken Mays, Central Oregon Community College, Bend, OR; **John Frala**, Rio Hondo, Whittier, CA

Grand Ballroom G

Recruiting and Retaining Students: How Flexible Scheduling Meets Student Needs

Curious about innovative ways to help students complete coursework while maintaining their outside commitments? Discover the institutional and student benefits of flexible scheduling. A professor from BridgeValley Community and Technical College will discuss a pilot program at her college that is designed to recruit and retain students enrolled in technology majors who have time constraints that make attending college in the traditional fashion difficult. Learn how the program came to be, how flexible scheduling is laid out and can be recreated at any institution, and lessons learned while developing the program.

Christie Linger-Hunt, BridgeValley Community and Technical College, South Charleston, WV

The Role of National and International Frameworks in Building Effective Cybersecurity Programs

The cybersecurity industry has matured significantly over the last ten years. Several national and international frameworks are available for those building or updating their cybersecurity degrees and certificates. Over the last decade, organizations have established comprehensive frameworks for studying workforce and academic standards. The presenters will review each of these frameworks and discuss their purposes and applications. The session will also focus on how these frameworks should be used in developing structural materials, program outcomes, courses, and student credentials.

Chuck Bales, **John Sands**, Center for Systems Security and Information Assurance (CSSIA), Palos Hills, IL

Mills 3

Engage Your Students with Creative Data Visualization Projects

Looking for engaging programming projects for students? Rather than have students code solutions to isolated, abstract problems, wouldn't it be better to embed student exercises in broad, preferably interdisciplinary, contexts? The presenter will show examples of students coding their own infographics, interactive visualizations, and simulations. Working from data they collect, or from web data sources, students can use almost any programming language, leveraging beginner to intermediate skills to produce informative graphical solutions. Examples from introductory to advanced will be shown and discussed, in languages ranging from Java and Python to Linux shell scripts.

Jerry Reed, Valencia College, Orlando, FL

Parkview

Evaluation: The Secret Sauce in Your ATE Proposal

Planning to submit a proposal to the ATE program? Then don't miss this presentation! We will cover the essential elements of an effective evaluation plan and show you how to integrate them into an ATE proposal. We will also provide guidance on how to budget for an evaluation, locate a qualified evaluator, and use evaluative evidence to describe the results from prior NSF funding. To help integrate evaluation into their ATE proposals, participants will receive the Evaluation Planning Checklist for ATE Proposals and other resources.

Emma Perk, **Lyssa Wilson Becho**, EvaluATE, Kalamazoo, MI

Grand Ballroom B

Coordination Networks: Perspectives and Practices for Workforce Development Through Public-Private Partnerships

This session will provide strategies for engaging community members, government agencies, academic leaders, and industry partners in cooperative efforts to build a talent pipeline from community to careers in STEM. Topics will include the development of an NSF-funded Coordination Network and the framework supporting a comprehensive approach to addressing gaps in workforce readiness for emerging technology sectors. Attendees will participate in a facilitated discussion to identify core principles that can be applied across STEM disciplines. Strategies presented will include increasing participation in underserved and underrepresented communities and engaging stakeholders by creating a value proposition.

Thomas Tubon, Madison Area Technical College, Madison, WI

Grand Ballroom C

Cybersecurity Curriculum Development: Integrating Hands-on Experience and Industry Certifications

This session will focus on Miami Dade College's NSF ATE proposal titled Cybersecurity Opportunities and Methods that Promote Access to Student Success (COMPASS), which proposes to create an Associate in Science and a College Credit Certificate in Cybersecurity. Topics will include mapping KUs (knowledge units) for CAE (Center for Academic Excellence) designation, mapping to industry certifications, input from industry, and the state framework already in place. As part of the program an integration with the Cyber-Range training platform capabilities and tools allows trainees to experience and respond to cyberattacks in real-time.

Diego Tibaquira, Miami Dade College, Miami, FL

Grand Ballroom F

PathTech LIFE and LISTEN: Annual Report of Research on Technician Education Students

This session will present new findings from analyses of the PathTech LIFE survey of 3,216 students from 96 community colleges from around the county. These analyses examine student program satisfaction, campus resource knowledge and utilization, motivation to enroll, career and educational aspirations, and school-work-life balance issues among a diverse population of students. This session will also include information about PathTech LISTEN, a recently funded longitudinal investigation of students in technician education that will include two follow-up interviews with 150–200 PathTech LIFE survey participants. Attendees will develop strategies for applying research findings to impact student recruitment, retention, and completion.

Will Tyson, **Lakshmi Jayaram**, University of South Florida, Tampa, FL

Grand Ballroom G

Increase Your Social Media Presence to Improve Recruitment and Retention

Recruitment and retention of students is becoming increasingly reliant on building a strong social media presence. Learn about how social media platforms differ in their audiences and how to spread the word about your program on Facebook, Twitter, and Instagram. You will also learn to make your own social media graphics using free web tools.

Misty Wehling, **Susanne Helms**, **Tracy Niday**, Southeast Community College, Lincoln, NE

Grand Ballroom H

Enhancing Workforce Education in Arizona: A Model Internship Program

The Science Foundation Arizona Center for STEM developed an internship model that is helping Arizona's community colleges and high school technical districts prepare students in both urban and rural areas to enter the middle skills workforce. Twelve college and high school internship programs serving 347 students at 102 industry partners have been funded across five middle skills industry growth sectors. Nine programs have proven self-sustaining. Session participants will discuss common challenges and potential solutions to implementing and sustaining internship programs, while learning to adapt and implement the SFAz model to bridge the skills gap.

Anita Grierson, SFAz Center for STEM at ASU, Scottsdale, AZ

Mills 3

Aligning Employers and Classrooms: Using a Body of Knowledge to Analyze AM Program Syllabi

In this session, we will present our advanced manufacturing (AM) body of knowledge (BOK), developed with employers' perceptions of required worker competencies. We present results of research in which we have used the BOK to assess syllabi from several AM technician preparation programs in the rural Florida panhandle. We will discuss our process for refining and updating the BOK as well as providing recommendations to AM program leaders. We will engage session participants in discussion of our BOK content and how the BOK can be applied to their programs.

Marcia A. Mardis, Florida State University, Tallahassee, FL, **David Bouvin**, Chipola College, Marianna, FL

Parkview

Selling Your Ideas

Getting buy-in from your department and college can be daunting and often the first hurdle to clear when you are ready to embrace a new project or plan. Join us to review the basics of pitching ideas, practice your pitching skills in small groups, and take away insights on how to approach and sell ideas to your administration. Regardless of discipline area or industry sector, come away with tools and tips for advancing your projects.

Abbe Kesterson, Bluegrass Community and Technical College, Lexington, KY; **Mary Slowinski**, Bellevue College, Bellevue, WA, **Bridgette Kirkpatrick**, Carole Twichell, Collin College, Plano, TX

THURSDAY, July 25, 1:45-2:30

Grand Ballroom A

Working Technicians Tell Their Stories

This session will provide an opportunity for working technicians to share their experiences about attending community and technical college programs that prepare them for their positions. Technicians will speak from a "fishbowl" setting with the audience observing. Members of the audience will be invited to ask questions and will learn the "fishbowl technique," which is frequently used in industry.

Facilitator: **Terryll Bailey**, The Allison Group, Seattle, WA

Grand Ballroom B

Building a Technology Education Pipeline

Northwestern Connecticut Community College is working with the Torrington School District and area manufacturers to build a technology education pipeline from middle school to high school and on to the community college and careers. This collaborative effort involves coordinating activities with industry, providing math tutoring for students, and providing industry-related professional development activities for teachers. We will share how we structured our program and how we formed industry partnerships. Participants will be invited to share their experiences and will outline plans to bridge the gap between their local school districts, colleges, and industries. Supported by NSF ATE grant #1801062.

Sharon Gusky, **Doug Mooney**, **Amanda Gregg**, **Ashley Johnson**, Northwestern Connecticut Community College, Winsted, CT

Grand Ballroom C

Embedded AI in Smart Robots, Drones, and IoT Devices: Teaching Emerging Technologies in the Classroom

This session will focus on the current effort to distill the essence of the growth of artificial intelligence and machine learning and their implications to cybersecurity. As the processing power of specialized hardware increases, artificial intelligence and machine learning capabilities can be embedded in portable and mobile devices such as drones, robots, and other IoT devices. There is a need for consumers to understand the basic underlying technology behind these embedded devices and underlying privacy and security risks and concerns. The presenters will provide a broad overview of the topic and the benefits/risks involved, and will describe how these topics are integrated into classroom curriculum in standard CS courses found in many universities.

Debasis Bhattacharya, University of Hawaii Maui College, Kahului, HI; **Rajiv Malkan**, LoneStar College Montgomery, Conroe, TX

Classroom-Ready Interactive Content

This session will provide a hands-on demonstration of classroom-ready interactive content developed to support courses in networking, cybersecurity, electronics, chemistry, environmental science, and physics. The project to be discussed is the result of collaboration between internal subject matter experts (SME) at Brookdale Community College, external SMEs from around the country, and instructional designers. Content was developed using HTML5 and is therefore accessible on any device running a modern web browser. Participants can take content with them to host online, in a learning management system (LMS), and even offline without an Internet connection.

Michael Qaissaunee, Brookdale Community College, Lincroft, NJ; **John Sands**, Center for Systems Security and Information Assurance (CSSIA), Palos Hills, IL

Teaching IoT Concepts with the Raspberry Pi

In 2017 the presenters demonstrated how Internet of Things devices could be incorporated into curriculum using cost-effective technologies. In this session they will demonstrate how to do it with a Raspberry Pi. The flexibility of the Raspberry Pi makes it an ideal controller for the classroom lab environment. Attendees will learn how to use the device as an automation controller, a VPN appliance, a RADIUS server, and a media client using readily available open source software. Topics will include peripheral devices and lessons learned in applying the concepts in a classroom lab.

Brian Nelson, Lansing Community College, Lansing, MI; **Bill Saichek**, Orange Coast College, Costa Mesa, CA

Implementing a Backwards Design Process to Invigorate Your Project Curriculum and Delivery

Have you ever been tasked with developing curriculum from scratch? Does your curriculum need to meet the needs of multiple audiences? If so, where did you start? Building curriculum is never easy and can be very time-consuming. This session will explore the benefits of using a backward design approach and aligning curriculum with external standards. Learn more about the tools, techniques and lessons learned through implementation of the NEXUS NSF project.

Karen Wegner, **Michael Guericke**, **Lyndsie Gibbs**, Metropolitan Community College, Omaha, NE

STEM Learning Using Electric Guitars, CNC, and Now Acoustic Guitars

The STEM guitar project helps connect educators to STEM learning opportunities surrounding the guitar. Launched in 2008 and covering 48 states, the project now has over 800 trained faculty. The Electric Guitar Kit and curriculum was first; now CNC training focuses on manufacturing skills. The Acoustic Guitar Kit is new this year for the STEM learning areas of vibration, structural analysis, and non-amplified sound. Our presentation will cover how to get started, costs, hurdles and barriers to implementation, summer training opportunities, and a fun activity.

Thomas Singer, Sinclair Community College (The STEM Guitar Project), Dayton, OH; **Debbie French**, Wilkes University, Wilkes-Barre, PA

Personalized Approach to Promote Minority Women in Engineering

The presenter will share a personalized approach to the promotion of minority women in engineering. The session will include individual case studies and their results, along with reflections on ways to help minority women thrive in engineering careers and expand engineering communities on campuses and beyond. Attendees will learn novel techniques for reaching out to targeted populations to stimulate interest in engineering careers. The presenter will explain a customized approach to addressing the academic needs of underrepresented minority women in engineering. The session will highlight career decisions that have significantly improved the lives of students and communities.

Ramona Anand, Weld-Ed, Lorain County Community College, Elyria, Oh

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THURSDAY July 25, 2:45-3:30

Grand Ballroom B

Soft Skills: What Should Have Been Learned in Kindergarten

The top complaint by employers nationwide is the lack of soft skills in job applicants. The lack of soft skills can force college graduates to take jobs well below their education and technical (hard skills) knowledge. This session will explore WHAT soft skills are, WHY they are important, and HOW to develop and integrate soft skills into your curriculum. Join this session for an interactive discussion focused on designing activities that promote the development and assessment of soft skills to unleash the full potential of graduates by bridging the gap between job applicant behavior and employer expectations.

Erik Christensen, South Florida State College, Avon Park, FL

Grand Ballroom C

A Summer Undergraduate Research Experience to Connect Course-Based Research Experiences at Del Mar College

Del Mar College (DMC) has been revising science education with authentic discovery-based research courses. During the last three summers, a new Summer Undergraduate Research Experience (SURE) was developed based on our experience working with both PARE and SEA-PHAGES. During the SURE, students who completed the PARE course can use their newly discovered antibiotic-resistant bacterial strain for further study including 16s rRNA colony PCR. The student researchers have also been isolating a novel bacteriophage that infects their antibiotic-resistant bacteria. The SURE assessment data was collected by online CURE assessment surveys.

Daisy Zhang, **J. Robert Hatherill**, Del Mar College, Corpus Christi, TX

Developing Effective Career Pathways Ecosystem for Cybersecurity Programs

This session will present the results and impact of a grant partnership funded to explore career pathways ecosystems for cybersecurity programs in a seven-state region. The presenters will share research data, including successful career pathways programs in Illinois, Ohio, and Michigan. The session will also identify innovative programs in the elements that make up a successful pathway for students in cybersecurity from K-12 courses to college certificates and degrees. These programs also include internship and apprenticeship opportunities and supplemental student activities such as cybersecurity competitions and hackathons.

John Sands, Center for Systems Security and Information Assurance (CSSIA), Palos Hills, IL; **Kyle Jones**, Sinclair Community College; Dayton, OH; **Stanley Kostka**, Moraine Valley Community College, Palos Hills, IL

Building Partnerships with Industry: Providing Students with Industry Consulting Experience

The presenter will report a case study of a successful partnership between Lund Boats and Bemidji State University. Topics will include strategies for establishing positive relationships between industry and academic programs, and how to leverage these relationships to provide real-world consulting experiences for students.

Michael Lund, Bemidji State University, Bemidji, MN

Educational Technologies for Student Success

Educational technologies are very effective in helping students understand their learning styles and bridge the gap from struggle to success. They assist students battling with learning issues, poor memory, hearing loss, and physical disabilities. Come learn how you can partner with your student disability services office to increase your students' success by connecting them with educational technologies and valuable support services that will increase their learning potential. This presentation will also include a demonstration of the newest educational technologies used to address multiple learning styles, poor attention and memory, difficulty in reading textbooks, and hearing loss.

Mike Sauter, Saddleback Community College, Mission Viejo, CA

Short Modules Targeting Job Growth and Demand

Technical workforce education today has one main focus: Prepare students for "available" careers. Technical career disciplines have numerous career paths, requiring unique training for each. This makes it difficult to prepare students for "niche" areas. So, technical programs are forced to give students a general education in a particular technical discipline, with students learning career path specifics on the job. This session will share an approach to solving this problem: "short modules" introducing students to job-specific education in areas hiring.

Gary Beasley, LASER-TEC, Lillington, NC; **Chrysanthos Panayiotou**, LASER-TEC, Fort Pierce, FL