

2017 HI-TEC Main Conference Sessions

WED 10:15

1A

Mechatronics Certifications: From Confusion to Clarity

An increase nationwide in both new programs and programs transitioning to mechatronics from related fields reflects a pain point among America's manufacturers: a need for automation, mechatronics, advanced manufacturing technicians who can program, set up, assemble, maintain, and troubleshoot automated equipment in nearly all industry sectors and applications. This expert panel and audience discussion will focus on certifications in mechatronics education. Topics will include fundamental skill sets, assessment protocols, resources, costs, industry use, and industry support. Bring your confusion and leave with clarity and a plan for what to do for your program.

Moderator: **Marilyn Barger**, Florida Advanced Technological Education Center of Excellence (FLATE), Tampa, FL;
Panelists: **Stephan Girard**, PMMI, Reston, VA; **Rebekah Hutton**, NIMS, Fairfax, VA; **Lauren von Steuben**, Siemens, Berlin, Germany

1B

Environmentally Benign Standalone Photovoltaic Systems (PV) for Disaster Relief and Remote Areas

The proposed title of our presentation is related to the area of "energy and environmental technologies." The purpose of our presentation is to provide an overview of environmentally benign standalone PV systems that can (1) meet the immediate heating, cooling, and lighting needs of homes and businesses in the aftermath of a disaster and (2) provide electricity for everyday living in remote areas. Initiatives and programs for making solar-generated electricity affordable for low-income people both in the U.S. and developing countries will be discussed. The presentation will also demonstrate the use of web-based software tools and databases for the design and performance analysis of PV systems.

Salahudin Qazi, NS Technological Consultant LLC, Hollywood, MD; **Abraham Michelen**, Northeast Advanced Technology Center (NEATEC), Albany, NY

1C

Using Questionmark, an Online Testing Platform, to Conduct a Performance-Based Certification

SpaceTEC, through its sister organization CertTEC, has created a unique avionics technician certification for the aerospace industry powered by Questionmark, a robust assessment management system. Combining knowledge and practical tasks, the assessment allows for hands-on demonstration of knowledge and skills. Measurements and troubleshooting are performed on an electronic trainer using proprietary electronic card sets. Questionmark's assessment software allows HTML coding to be used to create interactive buttons that allow test-takers to communicate with question banks through the testing platform. Rollout is expected in the second quarter of 2017.

Steve Kane, Carolyn Parise, National Resource Center for Aerospace Technical Education (SpaceTEC), Cape Canaveral, FL

1D

Using Business Feedback to Align Curriculum and Stay on the Cutting Edge

The National CTC's model for using business/industry relationships and uniquely managed quarterly meetings recently continues to help steer curriculum development into new areas of emerging IT technology. This forward-looking approach ensures that programs always stay current and that students learn the skills necessary to be "workforce ready." Attendees will learn how the National CTC used this method to begin shifting classroom focus away from traditional IT foundational topics and more towards cloud innovations, the Internet of Things, and SDN. The session will also provide strategies for using this model, which can work with any technical discipline.

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

1E

The Community College Innovation Challenge: Engaging Students in STEM Innovation and Entrepreneurship

The Community College Innovation Challenge invites community college students to propose innovative STEM-based solutions to real-world problems. The challenge, co-hosted by NSF and AACC, enables students to use STEM to make a difference in the world and helps to incorporate research into community colleges' traditional teaching missions. In this session, a faculty mentor and student team from Del Mar College, TX will share information on their challenge project and how they honed entrepreneurial and strategic communication skills as part of an innovation boot camp. Learn about this unique opportunity and how to assemble a student team to apply for the 2018 challenge.

Ellen Hause, American Association of Community Colleges, Arlington, VA; **V. Celeste Carter**, National Science Foundation, Washington, DC; **Danial Nasr Azadani**, **J. Robert Hatherill**, **Reavelyn Pray**, **John Ramirez**, Del Mar College, Corpus Christi, TX; **Julianne Grose**, Brigham Young University, Provo, UT

1F

Funneling Students to Pathways in Nanotechnology

One focus of NEATEC is to increase student interest in pursuing educational pathways leading to careers in nanotechnology. At the 7-12 level, this is accomplished in two ways. The first way is through our NEATEC Learning Modules (NLM). An NLM is a self-contained unit that can supplement existing grades 7-12 science, math, and technology lessons. The second way is through awareness sessions provided to school guidance counselors. In these sessions, counselors are educated about the many careers available in nanotechnology and the pathways that lead to those careers.

Mary Ann Nickloy, **Kelly Fahrenkopf**, Northeast Advanced Technology Center (NEATEC), Albany, NY

1G

ATE Industry Partnerships: Understanding Challenges, Impacts, and Successful Implementations

The Working Partners Research Project is investigating how the NSF-ATE community partners with industry to create and sustain robust, relevant programs, projects, and centers. Join us to review the primary industry partnership models gleaned from our research across this diverse set of practitioners. Learn what the data is saying so far about challenges, impacts, and successful implementations, and share your experiences with the group. Presenters will also provide information and ask for participant input regarding the project's online toolkit, which will make this research, data, and accompanying case studies easily accessible for all.

Mary Slowinski, Working Partners Research Project, Bellevue College, Bellevue, WA; **Rachael Bower**, ATE Central, Madison, WI

1H

Connecting Industry Needs and Students with Competency-Based Digital Credentials

Digital badges are a new way of credentialing that goes beyond certificates and degrees. Digital badges give students a way to showcase skill mastery and workplace competencies online, on-demand. Employers benefit from digital badges because badges provide a complete story of a learner's skills that shows the correlation between skills acquired, validation of skills, and industry-recognized credentials. Badging in higher education got off to a rough start, with many dismissing it as a passing fad or comparing it to merit badges earned in scouting, but it is gaining ground. This session is about what's taking place today in Colorado Community College System's Advanced Manufacturing digital badging.

Jinnie Cheippo, Colorado Community College System, Denver, CO

WED 11:15

2A

Cultivating a Precision Agriculture Technology Program

This session introduces precision agriculture technology, an emerging field that involves the use of technology for production agriculture and green industries such as organic farming, nurseries, and sports turf management. Clark State Community College in Ohio is engaging partners from these green industries to develop high school and college faculty and to create a degree program to prepare students for careers in precision agriculture technology. The ATE project evaluators will discuss the technologies, present progress to date, and discuss the challenges of evaluating a rapidly advancing, emerging technology program.

Cathryn Balas, Clark State Community College, Springfield, OH; **Gordon Snyder**, National Center for Optics and Photonics Education (OP-TEC), Waco, TX

2B

Engineering Technology Education in the United States: Report of a National Academy of Engineering Study

Two members of a National Academy of Engineering (NAE) committee will present the results of a two-year study of engineering technology (ET) education in the United States. The NSF-funded project collected federal educational and occupational data and conducted surveys of two- and four-year ET program leaders and employers of engineering technicians and technologists. The presenters will discuss findings and recommendations pertaining to ET education and its relationship to traditional engineering, supply and demand issues, educational and employment pathways, and needs related to data collection and analysis.

Dan Hull, National Center for Optics and Photonics Education (OP-TEC), Waco, TX; **Imelda Cossette**, National Resource Center for Materials Technology Education (MatEdU), Lynnwood, WA

2C

A New Approach to Teaching Mobile App Development

The rising demand for mobile app developers requires colleges to move swiftly to prepare a qualified workforce. Through NSF funding, an innovative AAS degree in mobile app development at the Rochester Institute of Technology is being implemented to address this challenge. Unlike other app development curricula, this fully industry-driven program uses a native cross-platform approach. Time normally spent teaching students about different platform languages can be devoted to mastery of C# and cross-platform software design and analysis. This presentation will discuss our unique approach to teaching mobile application development and our experiences in developing the program.

Brian Trager, **Elissa Olsen**, **David Lawrence**, National Technical Institute for the Deaf at Rochester Institute of Technology (DeafTEC), Rochester, NY

2D

How to Change Skeptics to Enrolled Students Using the Innovative BYO Video Tool

The SC ATE National Center for Expanding Excellence in Technician Education (creators of TeachingTechnicians.org) and Pellet Productions, Inc. (creators of ATETV.org) will discuss the challenges of recruiting students for advanced technology careers and will help educators stimulate career interest and recruit students into technician education programs using a turnkey Build Your Own customizable video tool. The tool and repository of micro-content video snippets for building videos are available online free of charge. Participants will learn to use the customization user interface for building their own locally specific videos. Tips for effective video marketing and customization options for programs and institutions will be shared.

Anthony Manupelli, Pellet Productions, Boston, MA; **Elaine Craft**, **Emery DeWitt**, SCATE National Resource Center, Florence, SC

2E

Closing the Achievement Gap via Remotely Accessible Technology and Problem-Based Learning Experiments

The Remotely Accessible Instruments for Nanotechnology (RAIN) Network (led by NACK) is growing and now has more than ten providers across the United States. Several classroom laboratory activities that integrate remote access have been created and are now available for use in K-to-college classrooms. The presenters will share the results of a recent study on the impact of using problem-based learning (experiments from the RAIN library) integrated with remote access technology (from RAIN providers) focused on underrepresented minority student populations. Extension of remote access into other technologies will also be explored.

Robert Ehrmann, Nanotechnology Applications and Career Knowledge (NACK), University Park, PA; **Jared Ashcroft**, Pasadena City College, Pasadena, CA; **Kristine Schroeder**, Seattle's Hub for Industry-driven Nanotechnology Education (SHINE), Seattle, WA; **Raymond Tsui**, Arizona State University, Tempe, AZ; **Tony Dalessio**, Erie Community College, Williamsville, NY; **James Smith**, Salt Lake Community College, Salt Lake City, UT

2F

Promoting Inclusion of People with Disabilities in STEM

This panel discussion will focus on issues relative to increasing opportunities and inclusiveness for people with disabilities (Pw/D). Topics will include (1) how to increase Pw/D participation in high school and college activities; (2) how to make employers in high-tech fields aware of affordable accommodations that will increase employment opportunities for Pw/D; (3) accessibility accommodations developed at the HERL, DeafTEC, and AccessCSforAll; and (4) soft-skills training for Pw/D that produces a well-rounded approach to increasing STEM education/career opportunities for Pw/D.

Moderator: **Rachael Bower**, ATE Central, Madison, WI; *Panelists:* **Rory Cooper**, University of Pittsburgh, Pittsburgh, PA; **Denise Kavin**, National Technical Institute for the Deaf at Rochester Institute of Technology (DeafTEC), Rochester, NY; **Richard Ladner**, AccessCSforAll and AccessComputing, Seattle, WA

2G

From Belonging Uncertainty to Belonging with Certainty: Engaging Community College Students in STEM

Increasing accessibility to engineering pathways and creating innovative engagement and retention strategies for low-income, first generation (LIFG) students are important aspects of increasing diversity in STEM. Red Rocks Community College is piloting a multifaceted approach to better engage and retain LIFG students through design-thinking and innovative problem-solving around projects aimed at creating a better world. Strategies for mentoring projects in courses and makerspaces will be discussed.

Liz Cox, Jeremy Beard, Red Rocks Community College, Lakewood, CO

WED 1:15

3A

AMTEC and Purdue Technical Innovations: Advanced Troubleshooting Using a New AMTEC Virtual Simulator

AMTEC, an NSF ATE National Center of Excellence that specializes in mechatronics education for the automotive and advanced manufacturing sectors, will share its latest innovations in technical education. AMTEC has partnered with Purdue University's Center for Innovation through Visualization and Stimulation to bring advanced technical troubleshooting to students in a virtual working environment. Students are able to immerse themselves in a virtual safe lab-work environment as they process work orders, perform lock-out tag-out, select personal protective equipment, talk to operators, and troubleshoot technical problems replicated from AMTEC's integrated system developed by AMTEC's industry leaders.

Danine Alderete-Tomlin, Craig Hopkins, AMTEC National Center of Excellence, Versailles, KY; **Chenn Zhou, John Moreland, Michael Hoerter**, Purdue University Northwest, Hammond, ID

3B

A Biotechnology Curriculum: How to Start a Successful Program and Maintain It Long Term

Initiating programs presents many challenges. One speaker will detail how a successful biotechnology program at St. Louis Community College was initiated. Recommendations for new programs will be discussed in detail. The second speaker will talk about how challenges remain even with a well-established curriculum and what can be done to keep course materials relevant in this fast-paced, ever-changing field.

Elizabeth Boedeker, St. Louis Community College, St. Louis, MO; **Eilene Lyons**, Bio-Link, San Francisco, CA

3C

Preparing Technicians for Integrated Photonics Manufacturing

The 2016 \$610 million Integrated Photonics Manufacturing Initiative (IPMI) brings together more than fourteen academic and industry partners across twenty states. A critical component of the IPMI is technician-level workforce development. Many of the teaching resources required to support education and retraining of IPMI technicians are available from ATE centers and projects in photonics, nanotechnology, and semiconductor manufacturing. Key technologies will be described and matched with available educational resources including a new OP-TEC Integrated Photonics course and a 25-credit Integrated Photonics Certificate for two- and four-year colleges developed by NEATEC. Participants will discuss collaborative efforts to use these materials.

Abraham Michelen, Robert Geer, Northeast Advanced Technological Education Center (NEATEC), Albany, NY; **Dan Hull, Gordon Snyder**, National Center for Optics and Photonics Education (OP-TEC), Waco, TX

3D

Developing GeoINT (Geospatial Intelligence) and UAS (Drone) Courses and Programs

Exploration of new content areas of the GeoTech Center and the need for these fields of study at two-year colleges will be discussed. GeoINT and Drone application are two of the hottest topics in geospatial technologies.

Vince DiNoto, Adam Dastrup, GeoTech Center, Louisville, KY

3E

Breaking Down Barriers: Making Education More Accessible, Affordable, and Engaging

When we change how we think about education, we can break down the barriers of one-size-fits-all education. Innovative learning platforms with enhanced digital tools and high-quality OER content can create meaningful learning experiences. The result is improved student engagement and outcomes with significant cost reduction. For instructors, data-driven teaching is *proactive* teaching. Together, we can help students develop the 21st-century skills vital to succeeding in the workplace: critical thinking, communication, and problem-solving.

Joshua Moe, Odigia, Winston-Salem, NC

3F

Build Your Industry Partnership Portfolio Through Start-Ups and Small Businesses

Creating new industry partnerships with large corporations can be a difficult and long process. Seattle's Hub for Industry-driven Nanotechnology Education (SHINE) at North Seattle College has achieved strong industry partnerships by shifting focus towards developing relationships and internship pathways with small businesses and start-ups. SHINE presenters will explain their method, struggles, and results to date and will share a plan they are exploring for continuously improving as they move forward.

Kristine Schroeder, James Hyder, Seattle's Hub for Industry-driven Nanotechnology Education (SHINE), Seattle, WA

3G

Reaching Out to Underrepresented Populations

This session will share successful strategies for reaching out to underrepresented populations through engaging hands-on activities. These activities attracted people who might otherwise have little exposure to the highly technical program areas of lasers, robotics, and other advanced technologies. Best practices and lessons learned by the Midwest Photonics Education Center will be shared with attendees.

Greg Kepner, Midwest Photonics Education Center (MPEC), Ottumwa, IA

3H

Excellence with Integrity: College Success and Employability Skills

This session will provide participants with an overview of an employability skills pilot program collaboratively developed by The Robert D. and Billie Ray Center at Drake University, Des Moines Area Community College, and the Institute for Excellence and Ethics. Participants will learn about the project and will interact with tools and strategies used by students participating in the pilot. Participants will gain ideas for implementing similar projects at their institutions.

Stephanie Oppel, The Robert D. and Billie Ray Center at Drake University, Des Moines, IA

WED 2:15

4A

Building Inclusive Technology Communities Through Hackathons

HackHolyoke, the first student hackathon in the United States to achieve a 1:1 gender ratio, annually welcomes over 200 hackers from around the country to be fearless and truly innovative and to develop brilliantly new and disruptive technologies. In this session, HackHolyoke co-founder Eva Snyder and Major League Hacking's co-founder Jon Gottfried will discuss how you can create inclusive technology environments for all students on your campus, including underrepresented groups, providing a safe space for beginners to take the first steps and also give advanced students the opportunity to learn something new.

Eva Snyder, South Hadley, MA; **Jon Gottfried**, Major League Hacking, Brooklyn, NY

4B

Future Industrial Technologies with Students in STEM: Explore the Use of Arduino/Raspberry Pi, Robots, and Drones

Learn how to engage students in STEM. It can be done! The Youth Technology Academy (YTA) started with just twelve students in its first year and now it has over 1200 registered students per semester. How did that happen? Join this session to learn the process used to recruit underrepresented students from Cleveland, Ohio, and provide them with the training they need to become FIRST Robotics World Champions. In this session, you will experience what students go through in their technology training sessions, and you will see how Raspberry Pi and sensors can program an Arduino Robot to autonomously avoid all obstacles in its way.

George Bilokonsky, **Armin Rashvand**, Cuyahoga Community College, Cleveland, OH

4C

Contract Service Work at Community Colleges: CSO Bio-Link Summit II

The Bio-Link National and AC2 Bio-Link Regional ATE Centers present contract models first shared at a 2012 summit in St. Louis and a second 2017 summit held at Austin Community College, the location of a new wet lab incubator. Biotechnology community college program and industry representatives shared economic development strategies, contract models, and wet lab incubator work. The ACC Bioscience Incubator exemplifies how a college leveraged information provided in the first summit report. Learn lessons from community colleges that have experienced contract service and how you can apply them at your institution and with your local industry.

Elaine Johnson, Bio-Link National Center, San Francisco, CA; **Linnea Fletcher**, Bio-Link AC2 Regional Center, Austin, TX; **John Carrese**, City College of San Francisco, San Francisco, CA; **Deborah Davis**, Bluegrass Community College, Lexington, KY

4D

Spice Up Your STEM Content with Interactivity

Interactivity. It's the secret sauce for student engagement. This session will demonstrate interactive content spicing up environmental science, materials science, physics, and cybersecurity learning. As research and our own evaluation data demonstrate, the targeted use of interactive instructional content creates an immersive, non-linear environment that engages students and improves learning and understanding. Attendees will learn about free and inexpensive tools they can use to start creating their own interactive content.

Michael Qaissaunee, **Kelly Parr**, E-MATE 2.0: Building Capacity for Interactive Teaching and Learning, Lincroft, NJ

4E

How Can You Use Social Media to Increase Your Program's Enrollment?

For the last year, three community colleges have tested to determine whether their use of social media can boost enrollment in technical programs. The NSF-ATE Social Media Research project, led by Education Development Center and its partner Collin College, has engaged nationally recognized social media experts to help colleges develop and implement social media strategies founded on best practices. The session will share the project's findings, describing what worked and what didn't, and how other colleges can learn from the experience. Presenters will share planning guides that colleges can use to develop their own social media recruitment strategies.

Joe Ippolito, Education Development Center, Waltham, MA; **Ann Beheler**, National Convergence Technology Center (CTC), Frisco, TX; **Gordon Snyder**, National Center for Optics and Photonics Education (OP-TEC), Waco, TX

4F

PathTech LIFE: Preliminary Findings for a National Survey of Advanced Technology Students

PathTech LIFE (Learning, Interests, Family, and Employment) is an ongoing national survey of individuals completing coursework, certification, and AS/AAS degrees in advanced technologies at community colleges. These programs cater to adults with numerous and complex life challenges (i.e., family, personal, school, and work). This session presents preliminary findings that reveal how student pathways, career goals, and school-work-life balance influence program recruitment and retention. Session participants will discuss how findings can inform institutional efforts to support student success and will recommend next steps to improve research.

Will Tyson, Edward Fletcher, University of South Florida, Tampa, FL

4G

Creating Industry-Endorsed Personnel Certificates for the Technology Workforce

Evaluation of employee knowledge and qualifications is a challenging task. Micro-nanotechnology education programs around the country are collaborating with industry and government in a NACK-led effort to address this issue by creating a series of industry-endorsed stackable credentials based on the ASTM basic skill standards for nanotechnology education and workforce development. This session will focus on the process used to create the format and exams for these certificates, the results to date, and the applicability of the process to other technology areas.

Robert Ehrmann, Nanotechnology Applications and Career Knowledge Support Center (NACK), University Park, PA; **Raymond Tsui**, Arizona State University, Tempe, AZ; **Deb Newberry**, Center for Nanotechnology Education (Nano-Link), Rosemount, MN; **Amy Brunner**, Lockheed Martin, Goleta, CA

4H

Increasing Female Enrollment in STEM Programs

Through an NSF grant entitled *Skilled Workers Get Jobs 2.0: Appalachian Impact*, Asheville-Buncombe Technical Community College (A-B Tech) is collaborating with six community colleges in the Appalachian Region to share their successful strategies for recruiting and retaining women in STEM programs. This interactive session will share strategies A-B Tech implemented and show how partner colleges have adapted these materials. Faculty members from the partner colleges will share their experiences. At the conclusion of the session, you will have ideas and materials you can use to increase and retain your female enrollment.

Pamela Silvers, Skilled Workers Get Jobs: Appalachian Impact, Asheville, NC; **Sharon Suess**, Blue Ridge Community College, Flat Rock, NC; **Tamara Lasley**, Virginia Highlands Community College, Abingdon, VA

4I

Cross-Institutional Collaboration to Augment Workforce Training Programs for 21st-Century Employment

This presentation chronicles the collaborative efforts of teams from three community colleges in Northeastern Pennsylvania as a result of a multi-year federal grant. These programs, faculty, and staff resulted in augmented technology integration and technology-enhanced instruction across multiple allied health and technical fields within workforce training programs. We seek to raise awareness of the best practices that make these collaborations work. We can also show some of the high-impact ways we designed innovative curriculum and brought in advanced technologies and aligned our programs with industry standards and local employer needs.

Alison Diefenderfer, Doreen Fisher-Bammer, Kristine Schirripa, Northampton Community College, Bethlehem, PA; **Mark Choman**, Luzerne County Community College, Nanticoke, PA

WED 3:45

5A

FAA Part 147 Digital Curriculum and Virtual Reality Simulations: Technician Education for Aircraft Maintenance

The Center for Aviation and Automotive Technological Education Using Virtual E-Schools (CA2VES) is collaborating with Greenville Technical College in the creation of digital learning tools to support technician education in aircraft maintenance. The FAA certification (Part 147) is a comprehensive curriculum that has recently been approved for online instruction to help students prepare for the certification examination. This session will provide examples of current FAA Part 147 modules, complimentary virtual-reality simulations, and examples of assessment related to the FAA curriculum. Participants will understand the process of creating a curriculum based on industry needs and the formation and maintenance of partnerships between two- and four-year institutions.

Rebecca Hartley, Center for Aviation and Automotive Technology Education (CA2VES), Clemson, SC; **Ginny Moore**, Clemson University, Clemson, SC

5B

Don't Restrain Me, Retain Me: A Case Study of a Small Community College's Efforts at Retention

This session will focus on a case study of a small community college's efforts to boost retention in its process technology program. Retention efforts include data analysis and planning through pre- and post-assessment and robust strategies for industry, faculty, and support services. Methods, strategies, and outcomes will be the focus of the session.

Hugh Gallagher, Sarajane Hill, Community College of Beaver County, Monaca, PA

5C

Virtual Materials Tester Demonstration

A virtual materials tester allows high school and college students to experience tensile, hardness, and impact testing without having testing equipment present. This session will focus on how the virtual tester works and will compare learning results for students who use the virtual tester and students who use equipment. Results will also be presented for students who use the virtual tester in preparation for equipment use. All participants will receive the virtual tester software and reference materials.

Lorraine Kapka, Sinclair Community College, Dayton, OH

5D

A Replicable Model for Interdisciplinary, Contextualized IT Instruction: Building Automation Systems

IT skills are integral to success in any technical field. But how many instructors have expertise in both IT and other technical fields? Are they confident in their ability to deliver interdisciplinary, project-based learning activities? This case study will present techniques, tools, and resources for supporting instructors in the facilitation of interdisciplinary, project-based learning. These instructional best practices were developed through an NSF/ATE grant focused on contextualizing programming through Building Automation Systems. Attendees will receive complete instructional materials for replication, including learning plans, videos, digital badging, and augmented reality.

Karen Wegner, Robert Nirenberg, Metropolitan Community College, Omaha, NE

5E

Providing Tools for Learning How to Learn STEM

Students who apply to programs in the School of Health Careers at Pierpont Community and Technical College are required to have a C or better in their physics course. For many of these students, the pressure to earn a good grade in a STEM course creates anxiety. Participants in this session will play the roles of students and use tools for learning how to learn factual knowledge and STEM skills in the context of interactive notebooks.

Martina Bachlechner, Pierpont Community and Technical College, Fairmont, WV

5F

Industry-driven Stackable Certifications for Advanced Technology Equipment

Seattle's Hub for Industry-driven Nanotechnology (SHINE) has adopted a 75-year-old training/certification/standard operating procedure (SOP) methodology to ensure students leave North Seattle College's Nanotechnology Program with a portfolio of demonstrable work experience and certified competency operating high-tech instruments. SHINE's industry liaison and lab manager will present the history behind this method (including its roots in "lean manufacturing"), its incorporation into SOPs, their experience recently deploying the process, and measurable results to date. Participants will leave this session with a template of the SOP that any lab or routine process can adapt, a sample SOP, and a model certification tracker.

James Hyder, Joseph Amann, Seattle's Hub for Industry-driven Nanotechnology Education (SHINE), Seattle, WA

5G

More Women in Advanced Technology: How To

Learn proven recruitment and retention practices and strategies so you can see more female students succeed in your STEM classes. The presenter will share proven practices and strategies that have increased female enrollment and female and male completion rates in STEM programs around the country. Participants learn about recruitment and retention strategies they can implement in their schools right away. This will be an interactive session with a worksheet you can bring back to your home institution.

Donna Milgram, Institute for Women in Trades, Technology and Science (IWITTS), Alameda, CA

5H

Helpful Tools and Strategies for Managing Grants and Other Projects

Running a grant often requires outside expertise. This session will provide tools and strategies to help new grantees navigate the tricky waters of project management. An NSF-funded project provides professional development and free resources to community colleges receiving DOL TAACCCT, NSF, and other grants.

Ann Beheler, Centers Collaborative for Technical Assistance (CCTA), Frisco, TX; **Marilyn Barger**, Florida Advanced Technological Education Center (FLATE), Tampa, FL; **Elaine Craft**, SCATE National Resource Center (SC ATE), Florence, SC; **Michael Lesiecki**, MATEC NetWorks National Resource Center, Phoenix, AZ; **Elaine Johnson**, Bio-Link National ATE Center, San Francisco, CA

THUR 8:15

6A

The Power of 3—Industry, Education, and ATE: 21st-Century Promising Practices

A panel of experts who have been successful in connecting the dots and forming real partnerships between education, federal grant-funded programs, and industry will share their approaches with current examples of moving beyond the status quo in career pathways, pre-apprenticeships, and apprenticeships. Attendees should expect to interact with the panelists during this session.

Craig McAtee, **Kris Ward**, **Rob Coolidge**, Tooling U-SME, Cleveland, OH

6B

A Case Study for Simulations as an Introduction to New Programs in Advanced Technologies

This session will review a case study of a simulation that introduces learners to mission critical operations. We will review the impact of this simulation on student recruitment and illustrate the requirements of technician positions in 24x7 environments. We will also demonstrate the simulation in specific scenarios as a group and discuss additional possible impacts.

Jennifer Lawson, **Noah Spencer**, Wake Technical Community College, Raleigh, NC

6C

Federal Resources for Cybersecurity Education and Talent Development

The United States needs highly qualified cybersecurity graduates entering the nation's workforce. A robust national network of educational institutions offering cybersecurity courses and programs is key, but generating interest in cybersecurity careers and studies among younger students is illusive. This session is designed to introduce new tools and methods to educators who can identify and cultivate cybersecurity talent in their classrooms. The US Department of Homeland Security (DHS) has developed a strategy for growing this interest at the state level through cyber-infused middle and high school curricula. Attendees will learn about this strategy and understand the basics of these curricula. At the same time, the session will focus on the tools, resources, and opportunities provided by DHS that can assist teachers in encouraging students to apply critical cybersecurity skills.

Daniel Stein, US Department of Homeland Security, CE&A, Arlington, VA

6D

Successful Job Placement for Technician Graduates: Strategies and Resources

The following elements impact all technical program completers as they seek to maximize their employment opportunities: (1) personal preferences and/or constraints that may influence employment location, (2) personal preferences regarding and/or demand for specific job skills (e.g., R&D labs, equipment development, operations, sales, field reps), (3) the ability to identify and contact employers, (4) the ability to use social media, (5) the ability to create a résumé, and (6) job search and interview skills. A new monograph will be distributed that will provide strategies and instruments that faculty can use to assist grads in their job searches. Attendees will create a plan using proven resources contained in the monograph.

Dan Hull, Gordon Snyder, The National Center for Optics and Photonics Education (OP-TEC), Waco, TX; **Frank Reed**, Midwest Photonics Education Center (MPEC), Ottumwa, IA; **Ron Darbee**, Lawrence Livermore National Laboratory, Livermore, CA

6E

Take the BAIT: Completing a Bachelor's IT Degree at Your Community College

The University of North Texas began an innovative IT bachelor's degree program in 2008. This degree accepts community college credit hours that are not usually transferred successfully. Now this same program is set to be available through partner community colleges across the United States. Want to learn more? Want to be a partner? Come learn from one of the program creators.

David Keathly, National Convergence Technology Center (CTC), Denton, TX

6F

The Whys and How of Captioning Your Classroom Videos

This session will review what you should know about having your videos captioned for classroom use, including the benefits of captioning, federal laws and regulations, the 99% accuracy standard, and the resources available for do-it-yourself captioning and captioning by outside vendors. We will also share one ATE project's journey through the captioning landscape.

Myra Pelz, Donna Lange, National Technical Institute for the Deaf at Rochester Institute of Technology (DeafTEC), Rochester, NY; **Kelly Parr**, E-MATE 2.0: Building Capacity for Interactive Teaching and Learning, Lincroft, NJ

6G

Expanding Technical Education Opportunities Through Distance Learning in Telepresence Classrooms

Resource-sharing between higher ed institutions has the potential to provide student-learning opportunities that transcend geographic barriers. As part of Project ReVAMP (NSF DUE #1400408), Normandale Community College, in collaboration with industry partners and other colleges, established collaborative distance-learning opportunities to deliver vacuum technology courses in a telepresence classroom. Vacuum technicians fill a critical role in advanced manufacturing industries. Distance learning partnerships provide students with access to education opportunities that may not be available locally. And these partnerships help sustain the vacuum technology program at Normandale. This presentation will explore the workflows and policies that support partnerships and sustainability. The presenters will provide policy and planning checklists.

Nancy Louwagie, Delmer Smith, Normandale Community College, Bloomington, MN

6H

Your Program + Certification = Empowered Workforce

Veterans Assembled electronics (VAe) will present case studies of service-disabled veterans who have completed the VAe training model. Interaction with companies demonstrating a demand for certified technical professionals in the electronics industry and the elements of ETA credentials that make VAe graduates competitive in the marketplace will be discussed. College of Western Idaho consistently utilizes ETA certification to validate qualified advanced manufacturing students for community employer partner Micron Technologies. ETA provides a way for school systems to validate their courses as a third party to technical education. ETA certifications test the knowledge and hands-on skills needed in today's electronics industry.

Michael Taylor, ETA International, Greencastle, IN; **Matt Vargas**, Veteran Assembled electronics (VAe), Providence, RI; **Mikel Douglas**, College of Western Idaho, Nampa, ID

THUR 9:15

7A

Planning a Mini Maker Faire That Showcases Your Regional Workforce Pipeline

Mini Maker Faires are community events that provide opportunities to showcase regional workforce pipelines. Planning the right mix of these opportunities can inform attendees of how an interest in technologies can go from at-home projects to careers for younger populations. In this session you will learn how the Regional Center for Next Generation Manufacturing (RCNGM) and the Manufacturing and Mechanical Technologies for Energy and Sustainability Program (MET2) were able to showcase education and industry partnerships and initiatives that are critical in preparing the technical workforce.

Karen Wosczyzna-Birch, Wendy Robicheau, Regional Center for Next Generation Manufacturing (RCNGM), Farmington, CT; **Eric Flynn**, Gateway Community College, New Haven, CT; **John Birch**, The Birch Group, Farmington, CT

7B

Using Story and an Interactive Movie to Immerse Students in a Regulated Workplace

Medical products and pharmaceuticals fuel the biotechnology industry, creating jobs for students. This industry is heavily regulated, so our students must learn to thrive in a regulated workplace. However, quality/regulatory affairs are challenging subjects, and a regulated workplace has a cultural and ethical foundation that is difficult to replicate in the classroom. For this reason, Bio-Link and Pellet Productions created an innovative interactive movie where students play the roles of characters in a biopharmaceutical workplace. In this role, the students make decisions. Depending on their decisions, different scenarios are enacted. Story and game thus become tools to help students learn at both a technical and visceral level. Participants will explore the interactive movie and will receive ancillary instructional materials.

Jeanette Mowery, Lisa Seidman, Bio-Link and Pellet Productions, Madison, WI

7C

Lasers and Their Applications in Biotechnology and Health Science

Laser applications are growing at an astounding rate in industry, security, agriculture, entertainment, transportation, defense, and many more fields, including biotechnology and health science. Applications in these two fields are numerous already and continue to expand rapidly, with more and more research devoted to improving health and prolonging life. In this session, participants will learn about the many laser types used and will learn a related lab. Handouts of a matrix of laser applications will also be provided.

Gary Beasley, LASER-TEC, Central Carolina Community College, Lillington, NC; **Chrysanthos Panayiotou**, LASER-TEC, Indian River State College, Fort Pierce, FL

7D

Integrating Data Visualization and Communication Tools in the Curriculum

Data visualization and analytics allows an organization to interact with data to identify business trends and insights. As more data is generated, understanding and presenting data in a meaningful way is becoming an in-demand skill. A couple of labs using tools such as PowerBI/Tableau can be incorporated in the curriculum to make our students more marketable. As we teach more courses online, engaging and connecting with students becomes a challenge. How do we create a feeling of connectedness when teaching online courses? Are we integrating tools in our curriculum? This presentation will demonstrate the data visualization tool PowerBI/Tableau. Also, attendees will be able to observe how tools such as Slack are being used in the classroom to foster honest, organic, and spontaneous conversation with our students.

Rajiv Malkan, Lone Star College-Montgomery, Conroe, TX; **Bruce Caraway**, Lone Star College-University Park, Houston, TX

7E

A Standard Model for Diagnostic Reasoning in the Mechatronics Lab

Join the NSF ATE Aerospace Career team in exploring how we have integrated a standard model of diagnostic reasoning instruction into lab exercises. Our method has the ability to turn each student-instructor interaction into an example of real-world problem solving.

Patrick Pritchard, David Smith, Aerospace Career Education, Auburn, WA

7F

Scaling a Successful STEM Program for Students and Teachers: A Case Study of SEMI High Tech U

The SEMI Foundation delivers a case study of how to scale and replicate a STEM program using two methodologies. The foundation's executive director, Leslie Tugman, will discuss the Certified Partner Program that trains and certifies organizations to independently deliver the SEMI High Tech U (HTU) program to students. Terry McSweeney of New York State United Teachers (NYSUT) will share how NYSUT has been delivering HTU to teachers to scale the program exponentially. This presentation will include success metrics for both the student and the teacher program as well as directions on how to bring HTU to your organization.

Leslie Tugman, SEMI Foundation, Milpitas, CA; **Terry McSweeney**, New York State United Teachers, Latham, NY

7G

Hearing from Working Technicians Who Received Their Education at Community and Technical Colleges

This session, back by popular demand, provides an opportunity for working technicians to share experiences about attending community and technical college programs and to discuss their current positions. The technicians will be in a fishbowl setting with the audience observing. Members of the audience will hear from the technicians, will be able to ask questions, and will learn the "fishbowl" technique that is used in industry. Terryll Bailey, President of the Allison Group, is experienced in this process and will facilitate the session.

Elaine Johnson, Bio-Link National ATE Center, San Francisco, CA; **Terryll Bailey**, The Allison Group, Seattle, WA

THUR 10:30

8A

Tools for Preparing Technical Students for Careers in Supply Chain Automation

This session provides access to two tools promoted by the National Center for Supply Chain Automation. The e-textbook *Introduction to the Automated Warehouse* resulted from a collaboration between the center and E-MATE. It is freely available as an Apple iBook or a PDF file. Interactive lessons survey supply chain technician professions and include videos, games, and illustrations. The Course in Technical Mathematics is freely available from Pearson Publishing and is implemented within their MyMathLab environment. Features include stackable modules with interactive assessments and videos. Examples come from electrical and mechanical engineering and include welding and blueprint reading.

Bob Sompolski, National Center for Supply Chain Automation, Des Plaines, IL

8B

CREATE Solar Institutes: Integrating Solar Energy Technology with Traditional STEM Curriculum

The Center for Renewable Energy Advanced Technological Education (CREATE) has developed a Solar Energy Institute for high school teachers. The three-day summer program provides teachers with hands-on experience working with solar technology and features instructional activities that can be replicated in traditional high school STEM courses. The institute serves as both an outreach and student recruitment strategy for Madison Area Technical College. In summer 2017, CREATE will replicate the solar institute with other schools in Washington and Colorado. The institute format may serve as an outreach and recruiting model for other schools in a wide variety of disciplines.

Kenneth Walz, Joel Shoemaker, California Regional Consortium for Engineering Advances in Technological Education (CREATE), Madison, WI

8C

Building a Virtualization and Cloud Computing Degree Program

Participants will learn how to build and offer a virtualization and cloud infrastructure degree program. Examples of course materials, labs, activities, and best practices will be shared. This material, along with vendor-supplied learning content, will enable an institution to develop a degree program with a virtualization and cloud competency.

William Wolfe, Center for Systems Security and Information Assurance (CSSIA), Palos Hills, IL

8D

Three Centers Preparing 21st-Century Technicians for the New Industrial Revolution

As we move deeper into the 21st century, it is increasingly evident that the advanced manufacturing industry needs technicians with skills not only from their main disciplines but in lasers, optics, and enterprise computing. LASER-TEC, in collaboration with CARCAM and AMTEC, provided professional development in the applications of lasers and fiber optics in advanced manufacturing for 50 instructors from 50 different colleges. In this presentation you will learn about the collaboration and the results of this work and will also discover how you can modify your program and be part of the 4th industrial revolution that is currently underway.

Chrysanthos Panayiotou, Natalia Chekhovskaya Kearney, LASER-TEC, Fort Pierce, FL; **Beverly Hilderbrand**, Consortium for Alabama Regional Center for Automotive Manufacturing (CARCAM), Gadsden, AL; **Danine Alderete-Tomlin**, Automotive Manufacturing Technical Education Collaborative (AMTEC), Versailles, KY

8E

How Can Academia and Dell EMC Partner to Help Students Prepare for IT Careers?

Learn about free technology-based courses (storage, cloud, and data science) that can enable students to develop highly marketable knowledge and skills to address the IT industry's top concerns. In this session, we will present the NETLAB+ storage and cloud lab libraries that support the Dell EMC ISM and CIS courses. In addition, the presenter will explain how you can adopt these courses as a participant in the Dell EMC Academic Alliance Program.

Kimberly Yohannan, Dell EMC, Franklin, MA

8F

Help With Securing a First, or Next, NSF ATE Grant: The NSF ATE Program, Mentor-Connect, and Moving-On-Up!

The NSF-funded Mentor-Connect Project can help you prepare a competitive proposal for a “Small Grant for Those New to ATE,” a special funding track in the NSF ATE program designed for institutions that have not received NSF funding in the past ten years. Participants will learn how to tap into one-on-one mentoring and self-help resources. Tips for how to move up from a small to a larger project grant will be shared. Learn how NSF ATE and Mentor-Connect are growing leaders in technician education.

Elaine Craft, SC ATE Mentor-Connect, Florence, SC; **V. Celeste Carter**, National Science Foundation (NSF), Arlington, VA

8G

Printing Silver Nanogrids on Glass: A Hands-on Investigation of Transparent Conductive Electrodes

Transparent conductive electrodes (TCE), a major component in touch screen devices, are ubiquitous. They are found in mobile phones, laptops, and tablets. Research conducted in academic and industrial laboratories is seeking alternatives to the commonly used TCE indium tin oxide (ITO). This presentation describes a hands-on experiment that allows students to create a TCE using a cost-effective microfabrication technique. Microcontact printing is used to deposit a template that encourages site-directed reduction of silver ions, resulting in the formation of transparent conductive glass. This experiment demonstrates how basic chemistry principles are used in fabrication of microscale and nanoscale materials incorporated into consumer electronics.

Wesley Sanders, Salt Lake Community College, Salt Lake City, UT

8H

Tweet, Post, Publish, and Promote: Outreach Strategies That Share Your Work with the World

Join us to learn about tools, resources, and strategies designed to help share your work, consider potential audiences, and raise your profile. Whether you're applying for your first ATE grant or are a seasoned expert, this session will help you discover new and interesting ways to plan for outreach. Panelists from ATE projects and centers will lead roundtable discussions and share materials 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, social media, TeachingTechnicians.org, videos, webinars, outreach planning, and lots more.

Rachael Bower, ATE Central, Madison, WI; **Marilyn Barger**, Florida Advanced Technological Education Center of Excellence (FLATE), Tampa, FL; **Emery DeWitt**, SC Advanced Technological Education Center of Excellence (SC ATE), Florence, SC; **Anthony Manupelli**, Pellet Productions, Reading, MA; **Michael Lesiecki**, MATEC Networks National Resource Center, Phoenix, AZ

THUR 11:30

9A

Introducing Technical Education at a Liberal Arts Community College

Northwestern Connecticut Community College is primarily a liberal arts community college with a strong focus on transfer programs. The college has been part of the Connecticut College of Technology for several years but only began offering technical courses four years ago. We now offer eight technical courses and two technical degree programs. We will discuss the rationale for developing the programs and our work with the Manufacturer's Coalition, the Regional Center for Next Generation Manufacturing, Oliver Wolcott Technical High School, and the Mentor Connect program.

Sharon Gusky, Tara Jo Holmberg, Douglas Mooney, Northwestern Connecticut Community College, Winsted, CT

9B

Teaching Cybersecurity Across the Disciplines

Cybersecurity has become a prevalent topic in many colleges, but how it should fit into the overall educational process is still not fully understood. A cybersecurity project at the University of Hawaii Maui College (UHMC), funded by the NSF SFS program, spans multiple disciplines and targets women and minorities. The goal of this project is to ensure that a broad audience of faculty, students, and practitioners is trained in the fundamentals of cybersecurity. This project also targets students in middle and high schools who are drawn to cybersecurity by mass media but are not aware of career opportunities in cybersecurity.

Debasis Bhattacharya, University of Hawaii Maui College, Kahului, HI

9C

Career Connections

Sponsored by the Manufacturing Technology Advisory Group (MTAG), the National Resource Center for Materials Science Technology Education (MatEdU), and Edmonds Community College, Career Connections is a workshop for K-12 career advisors and specialists. Since 2010 this series has brought together over 500 career professionals to learn about and discuss opportunities for advising students on careers in manufacturing technologies. Career Connections takes place twice yearly, featuring topics such as building bridges to industry, diversity in the manufacturing workplace, and innovation showcases. This activity is replicable in any academic and geographic area.

Imelda Cossette, Robin Ballard, National Resource Center for Materials Technology Education (MatEdU), Lynnwood, WA

9D

Spark Girls' Interest in STEM with the "Tech Like a Girl" Initiative

LASER-TEC partner colleges in Florida, North Carolina, and South Carolina conducted a series of "Tech Like a Girl" camps in partnership with the local chapters of the Association of University of Women (AAUW). Each camp consisted of multiple sessions rich with hands-on activities and informal discussions. Funds raised by AAUW from local companies and private entities were used to provide transportation, meals, refreshments, and informational materials. During this presentation, we will share the results, practices, and lessons learned through these efforts to engage local communities in the common goal of decreasing the gender gap in STEM programs.

Natalia Chekhovskaya Kearney, Chrysanthos Panayiotou, LASER-TEC, Fort Pierce, FL; **Constance Boahn**, Central Carolina Community College, Sanford, NC; **Mandy Orzechowski**, Tri-County Technical College, Pendleton, SC

9E

Teaching the Internet of Things Has Just Become Far More Interesting

Last year we demonstrated how Internet of Things (IoT) devices can be incorporated into your curriculum using cost-effective technologies such as media distribution, lighting, and environmental controls. The IoT explosion has led to new developments in easy-to-use—and easy-to-program—microcontrollers. Samsung, Amazon, and others have entered the marketplace and are providing their APIs at no cost and creating developers' networks to encourage new applications and services. This session will continue the discussion of how the IoT can be integrated into your curriculum and focus on exercises in programming microcontrollers using Samsung SmartThings, Amazon Echo, and Raspberry-Pis/Arduinos.

William Saichek, National Convergence Technology Center (CTC), Costa Mesa, CA; **Brian Nelson**, National Convergence Technology Center (CTC), Lansing, MI

9F

Funding Opportunities at the NSF: Programs of Interest to Two-Year Institutions

This session will provide an overview of programs at the National Science Foundation of interest to two-year institutions. A main focus will be on division of undergraduate education programs, but other programs will also be presented. Tips for crafting a competitive proposal will be provided.

V. Celeste Carter, Thomas B. Higgins, National Science Foundation (NSF), Arlington, VA

9G

Industry Need to Employ Talent: Be the Answer—How Can Industry Connect with Your Talent Pipeline?

Connecting is a two-way street. We need employer engagement and they need the talents our programs produce. In this session you will discover a variety of strategies that may better serve your partners, industry sector, and students. We will explore enrollment-to-employment strategies that can market your identity as a workforce “go to” and create engagement to grow partnerships. Grow your pipeline with services such as reverse job fairs and communication portals and develop strategies for placing completers and sharing analytics with economic developers.

Leah Palmer, Arizona Advanced Manufacturing Institute, Mesa, AZ; **Michael Lesiecki**, MATEC Networks National Resource Center, Phoenix, AZ

THUR 1:45

10A

Connecting Industry and Education to Establish Self-Sustaining Workforce Development Ecosystems in Supply Chain Automation

This presentation will inform attendees about the National Center for Supply Chain Automation’s new Industry-Education Workforce Forum initiative. The initiative involves the employment of a data-driven process to strategically target locales in areas of the nation with the greatest concentration of supply chain activity and to convene education and industry in a structured approach that results in the establishment of partnerships that continue to thrive as self-sustaining ecosystems.

Colleen Molko, National Center for Supply Chain Automation, Norco, CA

10B

NSA Cyber Security Centers for Academic Excellence (CAE): The Gold Standard

This session will review the NSA CAE2Y program and introduce national resources, funding, and assistance programs that are available for institutions interested in CAE. Learn how your institution can receive assistance in earning CAE status.

Stanley Kostka, Center for Systems Security and Information Assurance (CSSIA), Palos Hills, IL

10C

Smart, Connected, and Autonomous Cars: Future Impact on Technical Education

This session will discuss the rapidly evolving technology that is being implemented by automobile manufacturers and promoted by departments of transportation worldwide to make our automobiles safer and to ultimately eliminate traffic fatalities. Using modern communications and location (GPS) technologies, wireless networking, advanced sensor systems, and sophisticated robotics and control technologies, advanced driver assistance systems (ADAS) combined with vehicle-to-infrastructure (V2I) technology will eventually reduce traffic accidents and create safer roadways. This emerging technology will necessitate changes in how we educate two-year college students in automotive technology programs but will also alter what is taught in electrical/electronic technology (EET) programs.

Gary Mullett, Center for Advanced Automotive Technology (CAAT), Springfield, MA

10D

Roadmap for Intrusively Engaging Students to Program Completion and Beyond

In this session a workflow-designed intrusive advising roadmap will be presented, along with related forms and documents. Our experience has demonstrated that students are better prepared for program completion and job placement as a result of accelerated and collaborative technical training and intrusive support.

Deb Elder, Gretchen Sherk, Denise Griffey, Linda Dubar, Kayla Harrity, Johnson County Community College, Overland Park, KS

10E

Strategies for Grant Success: From Proposal to Implementation and Beyond

Do you have an idea for a grant project and are wondering what to do next? Do you have a current grant project and want to take it to the next level? If so, this session is for you. Presented by a grant writer and an IT program manager who have been developing grants together for over ten years, this practical session will present useful strategies to help you gain strong internal and external support and secure funding to establish or grow your grant.

Jennifer Peterson, Ernie Friend, Florida State College, Jacksonville, FL

10F

Ensuring YOUR Classroom Is Invitational to ALL Students

Classroom activities are hard to plan and their success can be difficult to predict. Classroom engagement makes students more successful, and the right activities can engage ALL students (traditional and nontraditional). As we encounter a more diverse student population, learn how to make your classroom inviting for all. Asheville-Buncombe Technical Community College (A-B Tech) received two NSF ATE grants focused on recruiting and retaining women in STEM programs. At the end of the workshop you will have materials you can adapt to engage students in your classes.

Pamela Silvers, Jim Sullivan, Rachael Tipton, Skilled Workers Get Jobs: Appalachian Impact, Asheville, NC

10G

Empowering Individuals to Become STEM Industry Scholars

View a newly developed program designed to prepare individuals for STEM jobs in high-demand industries in a local area. Discover how community partner collaboration is utilized to gather detailed information and expose individuals to targeted STEM occupations. Individuals will be educated on required skill sets, a “day in the life,” terminology, and local prospects for targeted STEM occupations. Uncover the many benefits of this in-advance exposure to the industry and customized E-based career plan.

Gena Leisten, Dynamic Works Institute, Waukesha, WI

THUR 2:45

11A

Empowered: VEX Robotics and Alternative Learning Program Students

This session will explore how a VEX Robotics experience, supported by a local college and the 360 Center, is impacting students enrolled in alternative learning programs. The students gain more than robotics as they participate, collaborate, and experience college through the VEX program. The presenters will explore the “hidden agenda” of forming 21st-century work skills and habits such as teamwork, documentation, problem-solving, learning after failure, sportsmanship, and communication. The MN VEX experience highlights the positive skills these students come with such as creativity and unique problem-solving techniques. All the while they gain academic confidence, explore technical careers, and see college as something they can do. Presenters include the Minnesota statewide VEX coordinator and automation instructor, a student support administrator, and an ALP director/VEX coach.

Paula Hoffman, Brad Jensen, Aaron Barker, 360 Manufacturing and Applied Engineering Center of Excellence, Pine City, MN

11B

Infusing Vital Employability Skills Into Advanced Manufacturing and Cybersecurity Programs

Equipping students with employability skills requires more than just a capstone project. The Necessary Skills Now project paired veteran advanced manufacturing and cybersecurity instructors with employers to develop twelve pilot projects that emphasize vital employability skills by integrating them into technical content in existing courses. Come learn about our field testing phase, upcoming professional development workshops, and how your institution can participate. (Project partners: CORD, CSSIA, SC ATE, FLATE, NSF)

Hope Cotner, Richard Hinckley, Necessary Skills Now, CORD, Waco, TX; **John Sands**, Center for Systems Security and Information Assurance (CSSIA), Palos Hills, IL; **Rick Roberts**, SC Advanced Technological Education Center of Excellence (SC ATE), Florence, SC; **Marilyn Barger**, Florida Advanced Technological Education Center of Excellence (FLATE), Tampa, FL

11C

Development of MEMS Course Content Using LabView and Arduino

The use of sensors such as accelerometers, gyroscopes, and pressure sensors in systems today is widespread. Electronic circuits are used to capture and transform sensor outputs, but currently we do not focus much on teaching this technology because it is perceived as too advanced. Three new MEMS courses introduce the use of sensors with design and testing of electronic circuits that include the use of LabView and Arduino microcontrollers and should provide a “home” for teaching this technology within an engineering technology program.

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

11D

Moving Manufacturing Workers Into Higher Paying Jobs: The Michigan Coalition for Advanced Manufacturing

This session will present an in-depth case study of the Michigan Coalition for Advanced Manufacturing, a consortium of eight Michigan colleges focused on enhancing training opportunities and career pathways for workers in the state. The consortium served over 3000 students, many of whom were older and highly vulnerable, at a time when overall admissions at the colleges were declining. The colleges doubled the number of employers they were working with and placed approximately three-quarters of program completers into jobs. This session will highlight recruitment, employer outreach, advising, and job placement services adopted by the consortium.

Heather Lewis-Charp, Deanna Khemani, Social Policy Research Associates, Oakland, CA

THUR 3:45

12A

Promoting Manufacturing Careers: Developing a Multi-layered Career Tool

Young people should be exposed to manufacturing careers in a fun and interesting way. Staff members at the 360 Center researched existing resources and found a need for an interactive tool to help students picture themselves in modern manufacturing careers. In this presentation, we will share what we learned from our research about engaging students and from developing content for the website, a quiz, and videos. We will also discuss best practices and demonstrate the career tool. In addition, we will talk about promotional strategies and integration with our other youth outreach resources.

Sue Selland, 360 Manufacturing and Applied Engineering Center of Excellence, Bemidji, MN

12B

Cybersecurity Educational Needs Require a Multi-Faceted Approach

Cyber attacks are growing for organizations that rely on industrial control systems for manufacturing and production processes. As ATE centers and projects share resources with the academic community, important issues regarding cybersecurity will be addressed in the areas of curriculum, faculty development, and cross-training as well as models for increasing the number of individuals entering into cybersecurity careers. This session includes a panel of experienced faculty and staff from across the U.S. who will examine current issues and needs in this field. Discussion will include ways to prepare students to recognize threats and implement countermeasures for protection.

Greg Randall, Consortium for Alabama Regional Center for Automotive Manufacturing (CARCAM), Gadsden, AL; **John Sands**, Center for Systems Security and Information Assurance (CSSIA), Palos Hills, IL

12C

Are You Thinking About Starting an Innovation/Maker Lab at Your College? Let's Talk!

Innovation and Maker events are hailed for producing creative, innovative, and somewhat unconventional solutions to business and social challenges. Participants are free to express ideas and create solutions that break through the barriers of traditional thinking. The obvious value of these events in promoting student learning has sparked a movement to create a similar experience in higher education. However, there are challenges with doing this and results may be slow to develop. In this session, representatives of Lansing Community College will tell their story of the failures and successes of operating an innovation/maker lab since 2010.

Eduardo Suniga, Aaron Mundale, Lansing Community College, Lansing, MI

12D

An Undergraduate Research Project: Teaching Non-Discipline-Specific "Soft" Skills

A technician who has critical thinking and problem-solving skills, understands the design of experiments and research methodology, can plan complex tasks, and possesses other positive non-discipline related attributes will have an advantage in obtaining and advancing within employment. Many employers expect their employees to have these skills. An undergraduate research project involving students at the onset has been initiated to teach these skills. This presentation will cover the project selection, student involvement process, integration of the above concepts, and results to date.

Deb Newberry, Center for Nanotechnology Education (Nano-Link), Rosemount, MN