

2019 HI-TEC Preconference Workshops, Special Interest Groups, and Tours

Mon 7/22, 8:30–Noon

Fiber Optics Technologies for Beginners

This workshop is intended for instructors who want to learn more about the practical aspects of fiber optics so they can create and/or enhance courses with the latest technologies impacting the termination, connecting, and testing of fiber optic networks. In addition to learning about the theory of fiber operation, participants will terminate a single mode fiber with the Corning Unicam system, create and test fusion splices, and use an OTDR for signal tracing and troubleshooting. Fiber to the home, passive optical networks, and distributed antenna systems (DAS) will also be covered.

Chrysanthos Panayiotou, LASER-TEC, Fort Pierce, FL

Introduction to Statistical Process Control (SPC)

Statistical process control (SPC) is key to the success of any quality assurance program. The use of statistics in controlling variations in any process is vital. Participants will gain the fundamental knowledge necessary to implement SPC and a practical knowledge of the use of statistical methods in analyzing the production and service processes. Participants will leave the workshop with an understanding of fundamental concepts of SPC and control chart theory and how to apply them. Two free software packages for teaching SPC will be distributed. **Participants must bring their own laptops.**

Abe Michelen, NEATEC, Troy, NY

Mon 7/22, 1:00–4:30

Increasing the Enrollment and Retention Rates of Women in Engineering Technology

This workshop will outline strategies, activities, and practices that have proven successful in increasing enrollment, retention, and graduation rates of women in energy systems engineering technology programs at Idaho State University. During this ATE project, female enrollment has increased almost 400 percent. There will be a discussion on lessons learned throughout the project and observations and reviews from current participants and program graduates who are now in the workforce. Attendees will participate in role-playing activities that demonstrate challenges and opportunities identified as obstacles to recruiting and retaining women in engineering technology.

Lawrence Beaty, Jodi Johnson, Idaho State University, Pocatello, ID

Using Arduino Uno and LabView to Learn MEMS Concepts

As the internet of things explodes, it is critical that technicians learn how sensors are integrated with electronics. This workshop will demonstrate the use of MEMS kits in tandem with Arduino Uno microcontrollers and LabView software. Participants will learn how pressure sensor devices and cantilever beams are built and used in educational environments. Participants will be provided mini-MEMS kits that will include pressure sensors and cantilevers with attached strain gauges. Both sensors will interface with an Arduino UNO and custom

shield. The Arduino will be controlled by a PC running custom LabView data acquisition code. Participants will receive all the material and software used in the workshop. **Participants must bring their own laptops.**

Andrew Bell, Matt Pleil, Southwest Center for Microsystems Education (SCME), Albuquerque, NM

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

This workshop will use a simulation in which cyber attackers breach a network perimeter. Detection of adversaries before exfiltration of critical information will be the primary objective. Participants will walk through scenarios and apply the following tools to address the attack: (1) architecture of advanced threat analytics and detection, (2) advanced threat analytics as a post-infiltration detection of lateral movement and privilege escalation, and (3) detection and alerting of abnormal user activity from internal reconnaissance user behavioral analytic techniques. **Participants must bring their own laptops.**

Israel Emmanuel, Century College, White Bear Lake, MN

NSF Proposal Writing and Mock Panel Review

This workshop will present an overview of NSF programs of interest to community and technical colleges and four-year institutions. The NSF merit review process will be presented, and a panel of principal investigators of current award recipients will discuss their experiences. Participants will review and rate a successful proposal and compare their ratings with those of the panelists who formally reviewed the proposal. Participants will leave with the materials used in the workshop.

Celeste Carter, National Science Foundation, Alexandria, VA

Mon 7/22, 8:30–4:30

Entrepreneurial Approaches to Sustaining and Scaling Educational Innovations

This workshop, sponsored by ASEE and NSF, will kick off a two-week course designed to guide participants in their exploration of innovative solutions to problems that address the needs of their audiences and/or markets. The course is especially for those in the ATE community who are interested in learning how to sustain and scale educational innovations, and how to network with education-focused innovators. The workshop will begin with an opening session at the HI-TEC conference. Enrollees will subsequently conduct approximately ten one-hour interviews, participate in online office hour sessions arranged with instructors, and attend an online closing workshop. Each participant will receive a \$500 stipend. Further information: <https://docs.asee.org/public/I-Corps-L/HITEC/HITECFLYER.pdf>

Karl Smith, University of Minnesota and Purdue University, Minneapolis, MN; **Russ Korte**, George Washington University, Washington D.C.

Missouri Biotech Day

The day will start with a tour of the Donald Danforth Plant Science Center followed by panel sessions covering best practices in high school education, what two-year alumni are doing in industry, and how education interacts with and supports industry through student internships and contract research work. At the end of the day, there will be three poster sessions. One session will focus on how two-year programs meet emerging industry trends. The other two will focus on research performed by college and high school students. Several of the panel and poster topics will be further explored in main conference sessions. **Participants must bring their own laptops.**

Linnea Fletcher, AC2 Bio-Link Regional Center, Austin, TX; **Richard Norris**, Center for Plant and Life Sciences, St. Louis, MO; **Elizabeth Boedeker**, St. Louis Community College, St. Louis, MO

Tues 7/23, 8:30–noon

New IT/Security Virtual Lab and Internet of Things Showcase

This workshop will feature free virtual labs and best practices supported by the National Convergence Technology Center. Attendees will test-drive IT/cybersecurity labs and learn how to implement them in their classrooms. The workshop will include a presentation on MSCE-aligned NetLab labs created as part of the InnovateX grant, as well as hands-on practice labs in Microsoft server and security. The workshop will also demonstrate how to set up a home automation microcontroller environment using off-the-shelf and open source products. **Participants must bring their own laptops.**

Ann Beheler, National Convergence Technology Center, Frisco, TX; **Ernie Friend**, Florida State College, Jacksonville, FL; **Timothy Pintello**, Daytona State College, Daytona Beach, FL; **Bill Saichek**, Orange Coast College, Costa Mesa, CA

Passing the FAA Part 107 Drone Pilot Certification Exam for the Education and Technical Community

As applications of unmanned aerial systems increase, so does the need for people who are certified to operate drones. The FAA issued a memo in 2016; Part 107 (released later) is easier and less restrictive to operate under than Section 333. Thus, the technical community and educators will benefit from a Part 107 remote pilot certification. This workshop will detail the federal regulations and how to be successful in taking the examination. The presenter will also provide instruction on key technical aspects and how to begin a career in the drone community.

Richard Schultz, National GeoTech Center of Excellence, Arlington Heights, IL

Additive Manufacturing: Providing Participants with Hands-on Experience Building Classroom Trainers

The advanced manufacturing program at Moraine Valley Community College enables students to gain up-to-date expertise in additive manufacturing. Device upgrades provide students with deeper understanding of additive manufacturing processes and result in machines that are more reliable and are capable of higher-quality product development. This workshop will include live demonstrations of retrofitting and prototyping low-cost additive manufacturing systems. Participants will be able to replicate the workshop for their students and business communities. **Participants must bring their own laptops.**

Chuck Bales, Kristine Christensen, Center for Systems Security and Information Assurance (CSSIA), Palos Hills, IL

TOURS: Tues 7/23 (afternoon)

Boeing Company – James S. McDonnell Prologue Room and Boeing Manufacturing Facility

1:00–5:00; bus loads at 12:30

More than a century of the history of the world's largest aerospace company will be revealed through models, paintings, photos, and dioramas depicting game-changing airplanes and spacecraft, many of which were built in St. Louis. Guests will see full-size Mercury and Gemini spacecraft, a drone ScanEagle, and large-scale models of some of today's manned and unmanned military aircraft including the Eagle, Hornet, Apache, and Air Force One, as well as varying scale models of rockets, missiles, and commercial jetliners. Attendees will also tour the

St. Louis Boeing Manufacturing Facility. The tour will conclude with a stop at St. Louis Community College, where representatives will present on their educational program at Boeing. *All attendees on the Boeing tour must be U.S. citizens. A valid state issued driver's license or a valid U.S. passport must be presented upon arrival to Boeing.*

Danforth Plant Science Center

1:00–5:00; bus loads at 12:30

Employing nearly 250 individuals from 24 countries, the Danforth Plant Science Center focuses on research at the nexus of food, energy, and the environment to improve the productivity and sustainability of agriculture. Tour attendees will learn about the history of the center and its founder. The tour will provide information on plant science and research and the plant science program at St. Louis Community College. Tour highlights will include the Center's agriculture innovation showcase, labs, growth chambers, phenotyping facility, greenhouses, and galleries.

Cortex Innovation Community

1:00–3:30; bus loads at 12:30

Attendees will tour CIC – St. Louis (an innovative space for co-working, labs, and private offices), BioGenerator Accelerator Labs (a shared lab space for bioscience companies run by a nonprofit investment organization), the Cortex Commons (a publicly accessible park), and Innovation Hall (a nonprofit event space whose Civic Lounge is dedicated to offering a free drop-in workspace for the community). A 200-acre innovation hub in midtown St. Louis, CIC comprises 390 companies that provide 5,700 jobs. CIC is managed by Cortex, mid-America's premiere community of bioscience and technology research. Founded by BJC HealthCare, the Missouri Botanical Garden, Saint Louis University, University of Missouri-St. Louis, and Washington University in St. Louis, Cortex catalyzes economic development in the region through the support of entrepreneurship and business acceleration.

SPECIAL INTEREST GROUP: Tues 7/23, 8:30–4:30

Micro Nano Technology Education Special Interest Group (MNT^eSIG) 2019

MNT^eSIG
MICRO NANO TECHNOLOGY
education
SPECIAL INTEREST GROUP

The 2019 Micro Nano Technology Education Special Interest Group (MNT^eSIG) will build on the success of the 2018 HI-TEC MNT SIG and NACK CIBP Forum as well as ongoing virtual MNT^eSIG meetings (www.mntesig.net). This full-day gathering will support MNT workforce improvement by building and fostering micro and nano technology communities across the country. Participants will collaborate in sharing ideas to strengthen and augment workforce development programs through

educational partnerships for tomorrow's micro and nano technology workforce.

Barbara Lopez, Matthias Pleil, Support Center for Microsystems Education (SCME), Albuquerque, NM; **Michael Lesiecki, Bob Ehrmann**, NACK Support Center, University Park, PA; **The MNT^eSIG Community**