

# OPEN Optics and Photonics Education News

Newsletter of the Optics and Photonics College Network

July 2019

## LASER Maze



The signature Laser Maze from Laser Fun Day 2019 at the University of Arizona College of Optical Sciences, run by the Student Optics Chapter (SOck). Benjamin M. Cromey UA [www.osa-opn-org/home/gallery/image\\_of\\_the\\_week/](http://www.osa-opn-org/home/gallery/image_of_the_week/)

### From the Executive Director



Are you preparing your students for the knowledge and skills that *some employers want*, or for what *most employers need*? How do you discern the difference? Does it really matter? [National Skill Standards can help.](#)

College faculty that are preparing technicians are encouraged to form - and listen, to an Advisory Committee that represents employers who are eager to hire their graduates. I have attended many of these Advisory Committee meetings, and participated in discussions; some with useful outcomes, and some with very confusing information that does not benefit program content - or the student completers.

**Asking the wrong question:** Asking your AC "What do you want your new techs to know & do?", is like asking a young child "What do you want for your birthday?" The typical response is "Everything related to the specific operations and equipment at our facility." Using this data can lead to creating a program that prepares students for a limited range of jobs. It can also lead to a curriculum with more specialty topics, labs and faculty than most colleges can afford.

**Leading the employers:** Meeting the technician requirements of most employers typically requires that your curriculum concentrate

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### Upcoming Events

07/22/19 - 07/25/19  
High Impact Technology Exchange Conference  
St. Louis, MO

08/5/19 - 08/6/19  
Fundamentals of Photonics Workshop at Indian Hills  
Ottumwa, IA

09/11/19 - 09/13/19  
National Coalition of Advanced Technology Centers (NCATC) Fall Conference 2019  
Twin Cities, MN

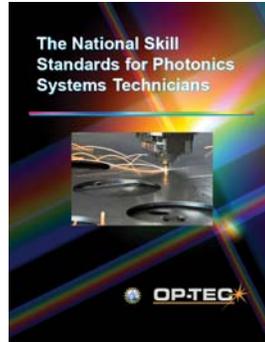
03/28/20 - 03/30/20  
AACC 100th Annual Convention  
National Harbor, MD

### AACC 100th Annual Convention

on the required knowledge and skills that are common to most or all employers. This requires a compromise that will probably not include narrow, specialty elements. These specialty items can usually be learned "on the job". To begin this conversation with your AC, I suggest that you ask them to review a model of knowledge & skills and comment on the content in terms of "What is essential?", "What can be removed?" and "What should be added?". This model is described in OP-TEC's *National Skill Standards for Photonics Technicians*.

### **Discussion of National Skill Standards for Photonics Technicians at the July OPCN Meeting**

Please obtain and review a copy of the *National Skill Standards for Photonics Systems Technicians* prior to our OPCN meeting at HI-TEC, later this month. This document was created from the input and review of over 80 photonics technician employers across the country - and across different photonics applications. It lists the Critical Work Functions, Tasks and Required Knowledge that are common to all these employers - and it leads to an effective curriculum design that most colleges can implement, using 3-4 optics/photonics courses, built on a solid technical core.

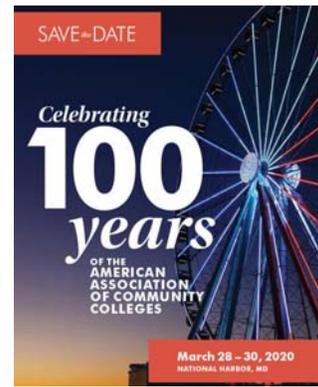


Colleges that have used the skill standards as a basis for Advisory Committee discussions have enjoyed the cooperation - and compromise from their advisors, leading to an efficient, effective program that benefits all parties. OP-TEC's National Skill Standards for Photonics Technicians can be found at <https://www.optecresources.org/photonics-skill-standards/>.

Dan Hull

## **Fundamentals of Semiconductor Lasers Diodes**

**A new educational module from LASER-TEC**



## **HI-TEC Fellowships & Conference Plans**

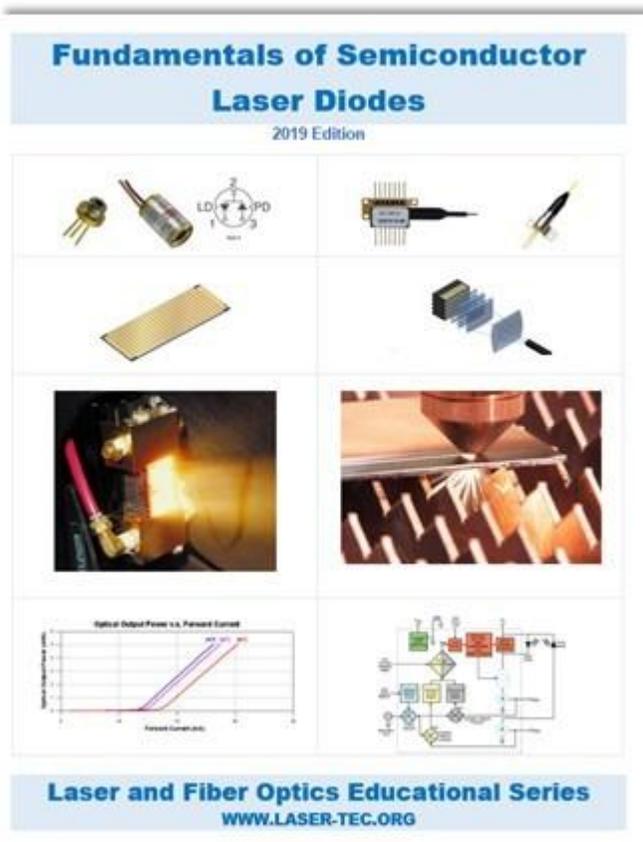


The national and regional photonics centers will host the next annual in-person OPCN network meetings and photonics industry site visits at the HI-TEC Conference, July 22-25, 2019 at the Hyatt Regency at the Arch in St. Louis, MO.

The HI-TEC Conference provides an opportunity for educators to learn, network, give presentations, share best practices, and disseminate project resources with other STEM educators.

OPCN events are being planned for the HI-TEC Preconference on Monday and Tuesday, July 22-23. The general conference keynotes, presentation sessions, and exhibits will take place on Wednesday and Thursday, July 24-25. The NSF ATE Laser, Optics & Photonics Centers booth is #211.

As in previous years, OP-TEC will be offering conference registration codes for OPCN representatives to attend. OPCN Coordinators and Members will receive priority for these free registrations.



This module is intended for use in a certificate or associate degree program in electronics engineering technology. It can enhance a course that teaches semiconductor diodes and Light Emitting Diodes, by introducing semiconductor laser diodes and their applications. This module will not only update the course content, but will provide the student with the latest skills industry expects.

If you would like to review the module and provide feedback please contact Chrys Panayiotou ([cpanayio@irsc.edu](mailto:cpanayio@irsc.edu)). A power point presentation and a test bank will be available by July 31st, 2019.



## MPEC hosts Nuts, Bolts & Thingamajigs Camp and WE STEM Day

MPEC hosted the Nuts, Bolts & Thingamajigs Manufacturing Camp for 4 days in June. The 12 campers, age 12-16, used the engineering design cycle to create projects and participate in related activities with digital fabrication tools, CAD software, and CNC lathes and milling machines to make two-piece aluminum yo-yos with their names engraved in them. Campers also used an Epilog 75-watt laser engraving system to cut and engrave a wooden project box to hold a solar powered phone charger and a laser pointer, along with 4 LEDs to indicate battery power level. The campers toured seven ATC manufacturing programs and participated in hands on activities where they welded metal parts together and made a "bug" out of a bolt and two washers. Campers toured 3 local manufacturing plants; 1) the John Deere production facility for agricultural products, where they observed a multi-million dollar laser system cutting parts; 2) Agri-Industrial Plastics Company, a plastic blow molding manufacturer, to experience the

Actively reporting OPCN coordinators may also request reimbursement for airfares following OP-TEC guidelines.

Interested educators should contact Christine Dossey at [cdossey@op-tec.org](mailto:cdossey@op-tec.org) to request registration codes and travel assistance.

## PACT Alumni Spotlight



**Jason Troyano's** desire to pursue an associate degree in electrical and engineering technology began when he was fueling airplanes at a local airport in Florida. "I have always been interested in the study of light," and recalls the moment he learned "that everything we see has no color until the light bounces off of the object."

Jason visited Indian River State College (IRSC) and found that "they had the exact program I wanted to get into: electronic engineering technology." Jason immediately signed up for their Robotics and Photonics Institute. In 2012, IRSC's Robotics and Photonics Institute offered Jason a job as an instructional aide, which allowed him to learn even more and gave him additional hands-on lab experience.

As his education was nearing its end, Jason began applying for jobs both in photonics and in healthcare, keeping in mind that his ideal career would involve a mixture of both. General Electric contacted him for a job interview and offered him a job a few weeks later. Jason's talent for troubleshooting and repairing electrical equipment is not the only advantage that he brings to General Electric; he also has strong communication

blow molding processes using several robots; 3) Frog Legs Inc. and Fizzix Manufacturing where the owner Mark Chelgren, discussed entrepreneurship, product design, and wheel chair suspension forks and caster wheel production manufacturing. Nuts, Bolts & Thingamajigs was sponsored by MPEC & funded by a grant from the Foundation of the Fabricators & Manufacturers Association (FMA) Nuts, Bolts, and Thingamajigs Foundation.



2019 NBT campers

FMA's foundation, Nuts, Bolts, & Thingamajigs, awards grants for community and technical colleges to host summer camps for middle and high school students, introducing these students to high-tech career opportunities in today's automated manufacturing industry. NBT grants can be used to fund materials, supplies, travel, printing, publicity, contracted services, salaries, and other camp-related expenses. Colleges can apply for NBT grants from July 1, 2019 through December 1, 2019. More information is available at <https://www.nutsandboltsfoundation.org/grants>.

MPEC also hosted the fifth annual Women Exploring STEM Day, which was attended by 27 high school girls, who participated in hands-on activities in laser & optics, robotics, computer software development, bioscience, automotive, and machining. The keynote speaker was Katrina DeVore, a software development specialist. Katrina shared the story of her educational and career pathway and some of the challenges she has faced in business and industry.



skills and enjoys working with teams.

Read more about Jason and other successful technicians in Success Stories in Photonics Careers (downloadable PDF at [www.optecresources.org](http://www.optecresources.org)).

**For Previous Issues of the OPEN Newsletter please visit OP-TEC's News Page.**

### Join the Conversation

We hope you enjoyed this edition of the OPEN newsletter. We would really like to hear from you. If there is some subject that you would like us to discuss or look into, please let us know at [pmanager@op-tec.org](mailto:pmanager@op-tec.org).

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