



## From the Director ...

NCATC Friends and Colleagues,

### *APPRENTICESHIPS USA!*

Did you know...NCATC is actively involved with two US DOL-funded apprenticeship grants to expand, refine, and improve the 21st century apprenticeships in advanced technology and manufacturing fields? And, we continue to expand our active involvement in many other pre-apprenticeship and apprenticeship initiatives with several NCATC Strategic Partners Alliance (SPA) members to share competency-based models that industry partners desire.

The Robert C. Byrd Institute (RCBI), an NCATC member in WV, offers apprenticeships to traditionally underrepresented populations such as women, minorities, and people with disabilities, expanding the pool of qualified workers. This fast-track program also can lead to direct certifications, establishing journey-level credentials desperately needed by today's manufacturers. In partnership with Tooling U-SME, RCBI has developed 15 high-demand apprenticeship frameworks with Related Training Instruction (RTI) and On-the-Job Training (OJT) competencies attained being tracked online in the expanded TU-SME Learning Management System, improving effectiveness and efficiencies.

And, the National Institute for Metalworking Skills (NIMS) – another long-time Strategic Partner of NCATC – is a round two DOL apprenticeship grant recipient to provide leadership and guidance on expanding apprenticeships in over 13 key advanced manufacturing careers. NIMS is providing guidance and incentives to support industry associations, companies, and educational training providers in establishing a Registered Apprenticeship programs.

Both the RCBI and NIMS Apprenticeship initiatives are focused on assistance – funding incentives and professional guidance – in helping community and technical colleges establish their own Registered Apprenticeship programs and connecting even more with industry in their communities. Learn more about RCBI's [Apprenticeship Works](#) and the [NIMS New Apprenticeship USA](#).

The NCATC Board of Directors and Staff look forward to seeing you at the **2017 NCATC National Events**. Building on our partnership with the **Fabricators & Manufacturers Association (FMA)** we have re-designed our **Summer Workshop** to target more faculty / instructors as well as workforce administrators as we are hosted by **Madison Area Technical College (WI), June 5–7**. And, we return to a full 2-day, NCATC-focused **Fall Conference** this year – hosted by **Portland Community College (OR), October 19–20**. Mark your calendars now!



We encourage you to stay regularly connected, via the NCATC website, social media, and e-newsletters like this one.

J. Craig McAtee  
NCATC Executive Director

## 2017 NCATC President's Message



It is my privilege to serve as NCATC Board President for 2017. I look forward to meeting many of you at our Summer Workshop in Madison, Wisconsin, and our Fall Conference in Portland, Oregon.

For 29 years, NCATC has been engaging community and technical colleges to address the advanced technology needs of business and industry. Our members are on the forefront of cutting-edge technology platforms and are a critical part of the nation's talent development system.

Most of us are facing similar challenges in our local communities. These include workforce shortages, skill gaps, and advancing technologies compounded by decreased funding to address these issues. In my 14 years as an active member of NCATC, I have found the organization to be a valuable resource for me and my institution because of the nationwide network of members with which to collaborate, gain new ideas, and troubleshoot problems. St. Louis Community College has also benefited from the network of NCATC Strategic Partners by having the opportunity to experience new technologies first-hand and by receiving member institution discounts on purchases of equipment and services for our ATC. Additionally, we are considering taking advantage of the NCATC Member Assistance Program (MAP) to evaluate our local programs and services to see how we compare nationally and how we can improve.

I emphatically affirm that SLCC as an institution, and I personally, have benefited greatly from our active and engaged participation in NCATC. I am sure you already know that NCATC is a great resource. I encourage you to become more actively engaged in NCATC events, activities, and resource sharing.

NCATC welcomes your thoughts, opinions, and suggestions. I would love to discuss ways in which you and your colleagues might contribute to our fall conference this October in Portland. If you are interested and would like to discuss potential presentation topics with me, feel free to call or email me. I know each of our member colleges is doing great things. Please consider NCATC as an avenue for promoting the good work you do and as an opportunity for professional development for you and your staff. Also, be sure to spread the word to other community and technical colleges in your region about the great things NCATC is doing. We all really do benefit from each other.

On behalf of the NCATC Board of Directors and staff, thank you for your continued support and we look forward to an exciting year.

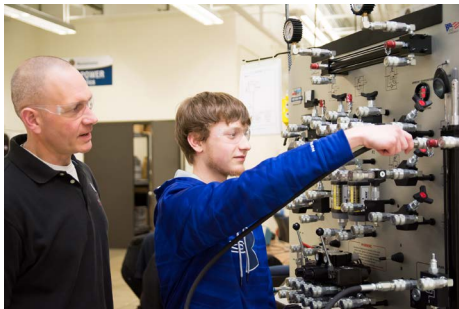
Don Robison  
2017 NCATC Board President

## Minnesota State Partnership Helps to Bridge Skills Gap by Providing Several Pathways to Learning

*Lauren Duensing*

Part of the [Minnesota Advanced Manufacturing Partnership](#)'s mission is to change the perception of manufacturing careers. "These are good jobs that pay good wages," says Anne Willaert, TAACCCT grant director for MnAMP, noting that manufacturing is struggling to overcome an "ancient reputation" that it is "dark, dirty and dangerous."

MnAMP is a Department of Labor-funded statewide consortium of technical and community colleges that aims to restructure and accelerate the U.S. workforce education system. MnAMP established the Learn Work Earn project, which targets Trade Adjustment Assistance-eligible workers, veterans, college students and other adult learners. The program focuses on careers in advanced manufacturing, specifically mechatronics, machining and welding. "One of the strategies under the grant is to align our academic credentials with industry-recognized credentials," says Debra Bultnick, statewide apprenticeship coordinator for the MnAMP. These credentials are competency-based, allowing MnAMP to establish a system that accepts credits for prior learning. Students can earn industry credentials alongside academic credits while achieving their college degrees.



Students can choose a variety of educational routes: certificates, diplomas and AAS degrees. MnAMP also is working with the Minnesota State University system to create articulation agreements between

the two- and four-year institutions. Students take a state standardized manufacturing core curriculum that is embedded within the first and second semester of the manufacturing courses.

These classes provide the foundation of a manufacturing education, and credits earned could lead to "both an 8-credit academic certificate, called Manufacturing Foundations, and the Certified Production Technician (CPT) credential from the Manufacturing Skills Standards Council," says Bultnick. Because the courses are standardized, they are fully transferable and portable among the 12 state colleges.

In addition to manufacturing-specific skills, advisors work with students on retention and completion and job placement skills. A career success skills course is also available, primarily "to incumbent workers and includes the soft skills employers are asking for: critical thinking, teamwork, appropriate behavior and communication, and other workplace-relationship skills. We have enrollees from all levels of a manufacturing business, and some employers make it mandatory for their incumbent workers," Bultnick says.

Training has become "much more accessible to our industry partners and aligns them with the industry credentials that have been embedded into our academic programs," Willaert says.

*See "Minnesota," page 5*

## Connecticut Students Immersed in Industry Projects through Mechanical & Manufacturing Engineering Technologies (MET2) Program

*Karen Wosczyzna-Birch, Executive Director, Regional Center for Next Generation Manufacturing*

The Mechanical & Manufacturing Engineering Technologies (MET2) Program builds on the success of the Life Support & Sustainable Living Program (LSSL), funded in part through National Science Foundation (NSF) Advanced Technological Education (ATE) grants. These programs also partner with the Regional Center for Next Generation Manufacturing, an NSF Center of Excellence, and the statewide Connecticut College of Technology. From 2008 to 2014, 293 students participated in 50 projects during the LSSL program, which included projects in partnership with medical hospitals and government entities, including NASA, the U.S. Coast Guard, the U.S. Geologic Survey and the CT Children's Medical Center. From 2015 to 2017, 144 students participated in the MET2 program, working on 26 projects that have been introduced by industry and faculty.

The main objectives of the MET2 program are to deliver a skills-based curriculum, business planning, professional skills, and intellectual property management for technical education and to engage community college and university students in a team-based learning environment and industry projects. The program was specifically designed to help develop and retain a vibrant workforce for Connecticut's high-tech companies.

In December of 2016, 53 community college and university students were recruited from Connecticut College of Technology member institutions for the 2017 MET2 program. In January of 2017, they completed a two-week Winter Intersession workshop that provided them with the necessary technical, professional, and entrepreneurial skills required to begin their research. These outstanding students worked in inter-institutional, self-managed teams on projects initiated by both industry and faculty. Teams presented their findings at the Connecticut College of Technology Meeting in April, hosted by the University of Hartford.

This year's projects include:

- **Prosthetics for Kids!:** Use additive manufacturing technologies to create a feasible alternative for the creation of prosthetics, providing high levels of customization at a fraction of the current costs.
- **Smart Guitar V3:** Design and build an aesthetically pleasing guitar with a built-in computational device that is controlled by a touchscreen to adjust volume, tone, audio compression, equalization, and distortion.
- **Bio-Reactive Ankle:** Create a bio-reactive brace to overcome the pain point in a patient's recovery and future activity levels.
- **Modular Manufacturing:** Build a modular machining system that will manufacture large scale builds for industry, using a combination of the best qualities of additive and subtractive manufacturing.
- **Bio-Printing Environment:** Create a 3D printing environment that is user-controlled and watertight and can support organic materials.

*See "Connecticut," page 5*

### Tooling U-SME Introduces Industry-first Certification in Additive Manufacturing

Additive manufacturing is a rapidly developing market, and the evolution of this technology is outpacing product design and development. As a result, there is a critical need for continuous training and development to ensure the manufacturing workforce keeps up with the latest advancements. [Tooling U-SME](#) – the workforce development arm of [SME](#) – has launched a portfolio of additive manufacturing learning and development solutions that includes access to specialized training packages, apprenticeship programs, and the industry’s first certification – all to support manufacturers that want to increase additive manufacturing operations at their companies/organizations and schools looking to prepare their students for careers in manufacturing.

According to the recently released 2017 Wohlers Report, the additive manufacturing industry reached revenues of \$6.063 billion in 2016, and with expected growth of 4.3 times over the next few years, the market is estimated to reach about \$26.2 billion by 2022. A number of factors contribute to the exponential growth of additive manufacturing – less material waste, faster tooling, quicker production time, lower costs, and shorter time to market/production.

“Restructuring the workforce to accommodate increased additive manufacturing operations is a major concern for companies that want to ramp up work in this market,” said Jeannine Kunz, vice president of Tooling U-SME. “More and more, manufacturers are increasing the number of additive-made parts in products so having a workforce with the right skills to use this new technology is an increasingly important priority for companies and schools.”

SME, a nonprofit organization that promotes advanced manufacturing technology, has been at the forefront of additive manufacturing for decades, starting in 1990 with the creation of an industry event known today as the [RAPID + TCT](#) conference, a gathering point for users and developers of 3D manufacturing. SME’s partnership with America Makes to accelerate additive manufacturing and 3D Print technologies led to the development of the Additive Manufacturing Leadership Initiative (AMLI), a collaborative working group representing SME, America Makes, the National Coalition of Advanced Technology Centers (NCATC), the Milwaukee School of Engineering (MSOE), and Technician Education in Additive Manufacturing and Materials (TEAMM).

The AMLI-developed body of knowledge provides the foundation for the first and only nationally-normed, stackable, or sequential,

credential process in additive manufacturing. The new Additive Manufacturing Fundamentals Certification is ideal for individuals seeking to advance their career, as well as community colleges and companies that want to grow a well-trained workforce with an understanding of additive technologies. This assessment will serve as a prerequisite for the next phase, the Additive Manufacturing Technician Certification, which will be rolled out later this year. These stackable certifications can lead to an additive manufacturing apprenticeship such as those Tooling U-SME supports through the U.S. Department of Labor’s Registered Apprenticeship Program.



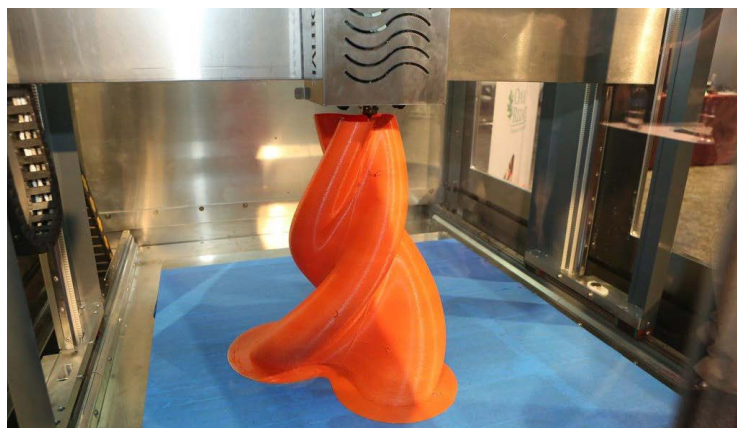
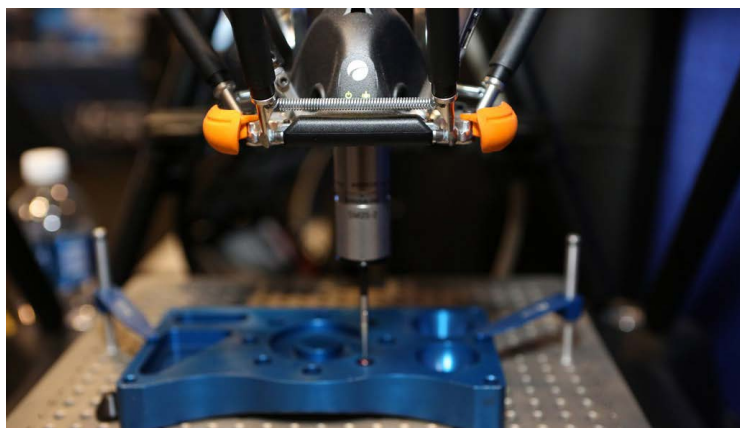
TU-SME was a funded partner in the Round 2 DOL TAACCT Grant awarded to Cuyahoga Community College (Tri-C) for developing a 3D/Additive Manufacturing one-year certificate of proficiency and enhancement of their Manufacturing Technician and Engineering Technology degree programs. Grant funding allowed TU-SME to develop eight 3D/AM online classes that are mapped to these two new certifications.

The first exam for The Fundamentals of Additive Manufacturing Certification takes place at the RAPID+TCT 2017 conference, May 8–11, 2017, in Pittsburgh.

“Tooling U-SME works with companies and educational institutions to build holistic workforce learning and development solutions that align to our certification and apprenticeship programs,” adds Kunz, who was recently elected to the 2017–2018 executive committee for America Makes. “Through our Turnkey Training, [online classes](#), instructor-led training, and supporting video materials, we’re able to provide the incumbent and future additive manufacturing workforce with industry-leading training that will ensure their success in the market.”

SME also promotes the advancement of additive manufacturing through its [Smart Manufacturing Seminar Series](#), content in [SMART Manufacturing](#) magazine, student competitions such as the [SkillsUSA Additive Manufacturing competition](#) and its member-only [Additive Manufacturing Community](#).

To learn more about SME’s work in additive manufacturing, visit [sme.org/3D](http://sme.org/3D). ♦





## Cold Forming Training: Rock Valley College's Story

Cold forming, also known as cold heading, is a metalworking process that involves the extruding and upsetting of raw wire into a finished blank through a series of punches and dies. The blank is then suitable for further processing such as thread rolling, slotting, drilling, and grinding. With the cold forming process, raw material wire at room temperature (hence the name "cold forming") is headed under high forging tonnage beyond its limits of elasticity into a shaped part. As the part is formed, the grain structure flows into the desired shape. This allows for a much stronger part than cutting the grains in a shaving process. Complex tool design allows for parts to be formed in many shapes and sizes with specific surface finishes. The high speeds of the process help to reduce production costs. These speeds can range from 100 to 400 pieces per minute, depending on the size and complexity of the finished part. Unlike other machining processes, the cold forming process produces minimal to zero scrap, resulting in substantial material costs savings. The cold forming process serves many industries, including medical, automotive, semiconductor, appliance, consumer, and aerospace.

Rockford, Illinois, has played a leading role in the cold forming industry. Rockford's strong manufacturing history began in the late 1800s with the craftsmanship of Swedish immigrants, who excelled especially in furniture manufacturing. By the turn of the 20th century, Rockford had become the second leading center of furniture manufacturing in the nation. Hardware companies were born to support the burgeoning furniture manufacturing industry. One such company, Elco Tool and Screw, was founded in 1922 primarily to supply wood screws. Over the next several decades many more fastener companies were created in Rockford. By 1967, Rockford ranked among the nation's five largest manufacturers of fasteners. Rockford's fastener business grew so large that in the late 1970s and early 1980s Rockford was referred to as the "Screw Capitol of the World." The early 1980s presented economic challenges for manufacturers across the nation. Locally, many fastener companies were negatively affected by a sagging economy and increased competition from foreign companies. Companies were forced to lay off employees, issue pay cuts, and (worst-case scenario) close their doors. As Rockford's fastener companies closed or moved to other parts of the country, the highly skilled fastener workforce also left. Cold forming machines sat idle on shop floors across town because the shops could not find header operators to run them.



As manufacturing began to rebound in the 21st century, employers struggled to find qualified workers, especially people with cold forming experience. To address this issue, a small coalition of Rockford fastener companies began to meet in collaboration with the TechWorks team located at the EIGERLab.

When Rock Valley College (RVC) acquired TechWorks in 2015, the cold forming training center project became a priority. RVC organized a cold forming/header advisory committee representing eighteen companies. The committee agreed to recreate the formerly successful Fastener Tech Center through the leadership and support of RVC. The center would help employers fill vacant operator positions and would provide a means for current operators to receive training on the latest fastener technologies.

Bernie Luecke, director of TechWorks, Ron Geary, vice president of instruction, academic affairs, and Deann Sharkey, administrative



assistant, began their quest to locate an instructor, a location, and equipment. Through numerous committee meetings and fastener company tours, they gained much knowledge of and respect for the industry. During the September 2016 Cold Forming Advisory Committee meeting, Dave Booker, a retired Fastenal employee, was voted to become the lead instructor for RVC's Cold Forming Training Center. As Geary and Luecke continued to explore the cold forming industry in Rockford, they were continually directed to Randy Loomis, president of Loomis International. Through Loomis's relationship with the president of Nakashimada Engineering Works, Ltd., Mr. Masahiro Nakashimada, the center received a donated NP60 2 die/3 blow cold header. Geary began to investigate possible locations with Jim Ryan, city administrator. The city of Rockford, pleased to be part of the project, leased RVC a building located at 424 Buckbee Street. This location would provide a classroom and the shop floor space to house the equipment needed for the hands-on portion of the training.

See "Cold Forming," page 5

• “Cold Forming,” continued from page 4 •

On November 16th, 2016, RVC held an open house at their new TechWorks Cold Forming Training Center. Representatives of more than twenty fastener companies attended, some traveling from as far away as Michigan. The open house was so successful that more companies donated equipment. Loomis donated a wire drawer and special tooling. Brad Baker, president of Slidematic, donated a Hartford O-400 Roll Threader. Mike Kranish, president of Mid-States Screw Corporation, donated a 3/16th's NATIONAL Single Die Double Stroke Cold Header. Supplies were donated by partnering companies such as Fastenal, Specialty Screw Corporation, Ford Tool, Wire Tech Inc., National Header Die, and IMPAX-SK Technologies.

Orientation for the first class of RVC's TechWorks Cold Forming Training Center was held on February 7, 2017. The job-readiness section began on March 6 and the NIMS [National Institute for Metalworking Standards] Certification on March 13. March 29 was the start of the classroom/hands-on training with graduation scheduled for May 17th.

• “Minnesota,” continued from page 2 •

The program's +Connect courses “were specifically designed to accelerate [studies] and eliminate the barrier of proximity to campus for full-time manufacturing personnel,” says Bultnick. The classes are similar to a Skype meeting; everyone can see and hear the instructor and fellow students. Participants can enroll in a course that meets during a two-hour timeframe for eight weeks. “Most +Connect participants take the courses right from their jobsite and go back to work when class is over,” she adds.

Participants in +Connect have a dedicated advisor who “works with instructors to support participants at the earliest indication of need,” Bultnick says. The advisor's “intervention has changed the traditional bell curve to reflect the high number of [course] completions.”

Many companies whose employees participate in +Connect provide tuition, books and fees, and pay their workers regular wages during class time. This support is crucial to outcomes, allowing students to achieve an education to which they hadn't previously aspired. “Passing college courses, earning both industry and academic certificates and racking up college credits gives them confidence to pursue a post-secondary degree,” Bultnick notes.

The flexibility MnAMP offers helps manufacturers compete more effectively because student employees stay current on new methods and technologies. It also supports apprenticeships that can help manufacturers grow their workforce.

There are two sources of state funding for manufacturing apprenticeships, Bultnick says. “Apprenticeships can be registered with the Minnesota Department of Labor or be conducted less formally as a dual-training program. South Central College, the lead organization in this grant, is asking (and getting) employers to pay tuition for their trainees while they work at the shop and work toward a diploma or degree. In effect, she says, “employers are now recruiting for our manufacturing courses as well as for their job openings.”

To learn more about MnAMP, contact Anne Willaert at [anne.willaert@southcentral.edu](mailto:anne.willaert@southcentral.edu). [Reprinted with permission from *FFJournal*.] ♦

For more information on RVC's TechWorks Cold Forming Training Center, contact Bernie Luecke at 815-921-2067 or e-mail at [B.Luecke@RockValleyCollege.edu](mailto:B.Luecke@RockValleyCollege.edu).

Sources

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“Cold Heading versus Screw Machining.” Specialty Screw Corporation, 16 June 2008, Web 16 March 2017.

“A Look Back...The story of Rockford furniture.” *The Rock River Times*, 1 July 1993, Web 16, March 2017.

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“History of Rockford Products Corporation.” Funding Universe, Web 16 March 2017. ♦

• “Connecticut,” continued from page 2 •

- Net Zero House: Turn a house that has not had any changes in terms of energy efficiency into an energy-efficient model home and education center for Connecticut homeowners.
- Rock Fracture Models: Create a more advanced model of rock fracture networks using additive manufacturing and computer simulation to accurately convey geological findings in a tangible way on a small scale for US Geological Survey researchers.
- Wireless E-Data: Build upon the progress from previous safety harness design teams to strengthen, condense, and integrate the device into a harness for construction workers.

These diverse teams were made of students from 8 community colleges and 4 universities. Forty-one percent of participants came from underrepresented populations and 20 percent were females. Historically, 98 percent of community college participants continue on to complete a Bachelor's Degree.

For more details, contact the author at [wosczyrna-birchk@ct.edu](mailto:wosczyrna-birchk@ct.edu). ♦

Stay tuned for the big reveal of NCATC's inaugural **Innovation Award!**

Full details will be shared during the Summer Workshop in Madison, June 5–7.





# CCTA | CENTERS COLLABORATIVE FOR TECHNICAL ASSISTANCE

*Do you need help with grant writing or pulling your hair out trying to work with industry?*

*Having trouble reaching out to special populations or just wanting to better communicate your project impact?*

## **The CCTA is the web portal for you!**

CCTA has great resources and information at your fingertips...

The Centers Collaborative for Technical Assistance (CCTA) was created in response to a request from the US Department of Labor (DOL) to the National Science Foundation to have ATE Centers provide technical assistance services to DOL TAACCCT grantees. NSF ATE subsequently funded the project to provide the following services:

- Success coaching on program/consortium issues
- In-person convenings
- Knowledge management (webinars, best practice quick guides)
- Peer-to-peer learning

Importantly, this technical assistance is directly applicable to National Science Foundation Projects and Centers as well as workforce-oriented programs of all kinds. You can watch any of the 24 recorded webinars or download their slide decks at <http://www.atecenters.org/ccta/>. Additionally, CCTA has published nine short "Best Practice Guides," convening documentation, and follow up Q & A voice sessions that follow some of the webinars.

To stay savvy and be in touch with those in the know, join CCTA's email list and you won't miss another workforce education hot tip or secret to success.

## NCATC SUMMER WORKSHOP

June 5–7, 2017  
Madison, Wisconsin

*Hosted by*



**MADISON**  
AREA | TECHNICAL  
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