



## From the Director ...

NCATC Friends and Colleagues,

Finding the workforce with the right skills and knowledge is a challenge that businesses in America face every day. As technology progresses ever faster, the workforce challenge will continue to grow with it. And, the human professionals in design, technician, and engineering roles in organizations will see changes to their job duties and will be challenged to acquire new skills and flexibility and to learn new ways of collaborating with machines.

Technicians also need to learn how to work with new design, engineering, and product development tools enabled by these new technologies. Organizations and professionals in technician, engineering, and design roles can't ignore the changes if they want to remain competitive. The *five biggest technology trends* that are disrupting manufacturing, engineering, and design today are:

**Robotics** deployed today can do much more than provide physical strength to tasks or move items around a warehouse—they can complement human work in a variety of ways, even with cognitive tasks. Engineering time and risk have been reduced thanks to software that can simulate robotic applications and maintenance. Robots can now “think out-of-the-box” rather than just be programmed to do repetitive tasks.

**Additive Manufacturing**, often still referred to as 3D (three-dimensional) printing, is transforming the way business is done as well as how things are designed and made. From 3D-printed parts on commercial airplanes to those implanted in humans through innovative healthcare applications, additive manufacturing is now incorporated in many areas of our lives.

**Artificial Intelligence | Machine Learning** continue to be the fastest-growing emerging technologies, so you likely aren't surprised that they are also disrupting design and engineering now that **Industry 4.0 is here**. Technicians and engineers must be uber flexible and

adapt to changes that artificial intelligence and machine learning are bringing to the way they work, from robotics to natural language processing to automation and much, much more.

**Generative Design** uses artificial intelligence (AI) and the computing power of the cloud to create design solutions that would never have been conceived by the human mind—at least not quickly.

**Digital Twins** harness the power of being able to design and build something virtually to see how everything comes together before you expend real-world resources and then discover a design flaw. A digital twin provides design, engineering, and manufacturing teams real-time information about how whatever they are creating will perform under a variety of circumstances.

NCATC will continue to expand, explore, and exploit important, emerging technology trends in advanced technology related and industry-driven workforce development needs for the 21st century, together with our education, workforce, and strategic industry partners and members. *Both of our 2020 national events will be immersed in Industry 4.0 related workforce development trends, as in the past several years!*

The NCATC Board of Directors and staff hope to see you at the **2020 NCATC Summer Workshop** hosted by Gateway Technical College in Racine, WI, on June 10–12.

And, save the dates for the **2020 NCATC Fall Conference** hosted by Metropolitan Community College in Omaha, NE, on September 29–October 2.

As always, we encourage you to stay connected, via the regularly updated NCATC [website](#), social media (*LinkedIn, Facebook, Twitter, etc.*), and quarterly e-newsletters like this one.



J. Craig McAtee, NCATC Executive Director & CEO

## LCCC Campana Center Expansion to Fuel Growth of Industry, Innovation & Workforce

Lorain County Community College (LCCC) unveiled the expansion and renaming of its Patsie C. and Dolores Jeneé Campana Center for Ideation and Invention on October 3 with an open house and presentation by Luke Williams, author of *Disrupt: Think the Unthinkable to Spark Transformation in Your Business*.

The Campana Center, originally opened in 2001, recently underwent a 10,000-sq-foot expansion, which included lab and equipment upgrades. The renovation was made possible through a private/public partnership that included nearly 20 federal, state, and philanthropic sponsors of the project. The expansion includes enhanced equipment and labs to provide students, business and industry, and the community greater access to tools and resources designed to stimulate new inventions, foster industry growth, and support education and workforce development—with the goal of positioning our region for new economic opportunities.

The expansion also better connects the Campana Center with LCCC's Nord Advanced Technologies Center, making the training and experiences received in both a seamless process. LCCC is one of twelve founding members of the National Coalition of Advanced Technology Centers (NCATC)—which now has 160 members.

“As the community's college, we focus on preparing individuals for in-demand jobs and filling the talent gaps of employers,” said LCCC President Marcia Ballinger, Ph.D. “In this era of rapid technological change, we need to also play a significant role in helping local companies stay competitive by adopting new technologies for greater productivity and to open up new market opportunities.”

The Campana Center offers business and industry affordable access to equipment designed to enhance competitiveness without

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## Pre-Apprenticeship Program Is Feeding the Talent Pipeline in New Jersey

You've heard the stories about the manufacturing skills gap and you're hearing it firsthand from local manufacturers. Educational institutions feel compelled to serve the community, and while they might already have excellent training in place for their students, it's not enough—it's not filling the specific requests from local manufacturers.

Raritan Valley Community College (RVCC) knew that in order to make a dent in the critical skills gap for area manufacturers, it had to start by attracting younger talent and getting them excited about a manufacturing career path.

RVCC already had in place a four-module stackable machining program that was competency-based, and met the skill and knowledge requirements of local manufacturers. It also had a Department of Labor Registered Apprenticeship program in place. The school's goal was to expose secondary students to manufacturing careers and provide advanced manufacturing career pathways with low barriers for entry.

In January 2019, RVCC was fortunate to receive the Pre-Apprenticeship in Career Educations (PACE) grant from the New Jersey Department of Labor. This grant enabled the college to start the process of generating a talent pipeline that fed directly into apprenticeships and jobs in the New Jersey region.

The PACE program provided pre-apprenticeship training for 15 high school students and 15 adults, with the goal of being a feeder for participants to work toward employment by transitioning into a full apprenticeship program.

RVCC's pre-apprenticeship program, which launched on July 22, 2019, offered 120 hours of training—including the new fast-track Tooling U-SME NIMS certifications—to area high school students

during the summer. With no time to waste, the college was concerned about getting students to commit to a 9 a.m.–3 p.m., four-day school week during

their summer vacation. To RVCC's surprise, it ended up having 12 excited high school students sign up on very short notice, and seven of those students kept it going during the school year by signing up for the RVCC manufacturing program. The adult pre-apprenticeship program has 19 registrants and is scheduled to begin this month.

Everyone who finishes the advanced manufacturing classes as part of the pre-apprenticeship curriculum is eligible to go into the full apprenticeship program. Employers meet with all of the pre-apprenticeship graduates to determine open positions, with the goal of taking them in as full apprentices. With a 93 percent placement rate, RVCC believes its pre-apprenticeship program will help place all of its graduates with companies that will allow them to continue their career journey.

And that is only the beginning. When RVCC started its manufacturing program, the college had only five students. This year, 20 students have registered and are on their way to becoming apprentices and employed. RVCC recommends that everyone get on board with a pre-apprenticeship program, as the benefits completely outweighed the efforts. The college is proud to be serving the community with advanced manufacturing education.

Learn more about apprenticeships by downloading Tooling U-SME's white paper, "[Apprenticeships: Modernizing a Proven Workforce Development Strategy](#)." ♦



• "LCCC Campana," continued from page 1 •

making a large-scale investment. These partnerships have resulted in a direct alignment between industry needs and LCCC's workforce and degree offerings, prompting the college to launch new degree programs in Blockchain, Industrial Internet of Things, Cyber Security, and Data Analytics. Specialized resources in the Campana Center include a digital manufacturing line, industrial 3D printing lab, and virtual reality cave.

"The Campana Center is Northeast Ohio's Manufacturing Marketplace, offering companies a one-stop solution not only to equipment, but to the services and talent needed to grow their enterprise," said Ballinger. LCCC, in partnership with local industry, recently launched an Applied Science in Digital Fabrication Technologies Degree that prepares students to work with subtractive and additive digital fabrication tools for tasks such as prototyping, proof-of-concept exploration, and rapid tooling.

Community members, including inventors, entrepreneurs, artists and educators, also have access to the Center's greatly expanded Fab Lab maker-space. Several STEAM camps for children and teens are programmed out of the combined facilities. These programs help youth explore STEM, Arts, Fab Lab, Advanced Technology, and Trades-Related activities to introduce them to diverse career fields.

The Fab Foundation, a non-profit based out of the Massachusetts Institute of Technology (MIT) Center for Bits and Atoms, has also designated LCCC's Fab Lab as a Super Lab. LCCC's Fab Lab qualified for the designation due to the level of offerings, capabilities, and commitment to providing community access.

For more information on the LCCC Campana Center, visit [www.lorainccc.edu/campana](http://www.lorainccc.edu/campana) or call (440) 366-7866. For more information on the LCCC Nord Advanced Technologies Center, visit [www.lorainccc.edu/natc](http://www.lorainccc.edu/natc) or call (440) 366-7564.

Follow these links for stories about LCCC students and grads who have benefitted from programs at LCCC's Nord Advanced Technologies Center and the Campana Center:

[www.lorainccc.edu/stories/from-fab-lab-to-industry-innovation/](http://www.lorainccc.edu/stories/from-fab-lab-to-industry-innovation/)  
[www.lorainccc.edu/stories/engineering-a-new-direction/](http://www.lorainccc.edu/stories/engineering-a-new-direction/)  
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[www.lorainccc.edu/stories/connecting-the-dots/](http://www.lorainccc.edu/stories/connecting-the-dots/) ♦



## Rock Valley College Awarded Workforce Equity Initiative Grant

Rock Valley College was recently awarded a \$1.5 million Workforce Equity Initiative grant from the Illinois Community College Board.

The RVC Workforce Equity Initiative (WEI) will serve approximately 150 low-income, minority persons within the College's district that are currently underserved and underemployed.

Participants in this initiative will be provided short-term educational opportunities that will lead to employment specifically in the sectors of truck driver training, computer numerical control (CNC) operation, cold forming, and industrial welding. The end goal for all participants of RVC-WEI is to establish them in jobs with sustaining wages and the tools to succeed, as well as prepare them for additional educational opportunities as they develop professionally.

The RVC-WEI initiative will provide participants with stipends to cover the cost of tuition, fees, and materials for courses required to

complete the identified short-term certificate. Students will also be provided with wrap-around support services, such as life and career coaching and financial support for transportation and child care, addressing their individual needs to be successful in completing educational requirements and securing post-completion employment.

"There have been many discussions in our community recently about the need to address the middle skills gap," said RVC President Dr. Doug Jensen. "We also are a region where there are over 40,000 residents who do not have a high school diploma, and where our poverty and unemployment rates are higher than the national averages. This workforce equity initiative will allow the College to address those issues as we continue to do our part to help Rockford transform itself into a Top 25 community."

"The fact that we were able to identify four existing College programs for the focus of this initiative shows that the College has already been actively addressing the needs of our community. This grant will go a long way toward helping us strengthen those efforts, while specifically targeting those individuals who need it the most."

Under the grant requirements, at least 60% of those to be served by RVC-WEI will be African American students. The grant also stipulates that at least 75% of participants will successfully complete their identified program of study within the accelerated time frame, at least 75% of participants will successfully complete life-skills training addressing the Illinois Essential Employability Skills (e.g., STU 103: Workplace Ethics and Job Readiness), and at least 60% of participants will continue within the field in which they prepared at the end of their program by either being employed in a full-time job at least 30% above the regional living wage or by being registered for continued training and education. ♦



## ProjectMFG: Launching a 5-Axis Skills Competition

In 2017, Presidential Executive Order 13806 was signed to improve U.S. Defense Machining and Manufacturing capability. One key point of the Executive Order addresses workforce and has elevated awareness among policymakers that we must address the skills gap in the defense industry specifically, and in manufacturing generally.

In February 2018, key industry stakeholders, including NIMS, Haas Automation, The Gene Haas Foundation, Lincoln Electric, and AMT – The Association For Manufacturing Technology, came together with Department of Defense (DoD) officials in the Office of the Secretary of Defense, Industrial Base Analysis and Sustainment (OSD IBAS) to begin planning for and designing a new 5-Axis CNC machining + welding skills competition for schools and student teams.

DoD sees this competition as a primary way to change perceptions about careers in manufacturing, to raise the bar on skills among machinists and welders, especially those coming out of CTE schools and community college programs, as well as to accelerate the immediacy at which local policymakers and education administrators must elevate their machining programs to address the current and immediate future needs of industry in 5-Axis machining.

The competition, operating under the code name ProjectMFG, is designed and produced by NIMS and modeled after the SkillsUSA National CNC Championships that NIMS normally produces.

Today in Washington, all new initiatives like this require a public/private partnership. The Gene Haas Foundation (GHF), Haas Automation, and The Lincoln Electric Company, along with many AMT member companies, are providing the capital, staff support, equipment, tooling, and software needed to launch and execute the competitions.



In early 2019, NIMS convened 5-Axis machining subject matter experts (SME) from across the industry and the Technical Work Group (TWG) sessions to develop the 5-Axis industry-recognized Standard and Credential, which are nearly complete and are in the validation phase. In addition to the 5-Axis Standard and Credential, NIMS is working on developing an industry-recognized Metrology Technician Standard and Credential in time for the "main event" for ProjectMFG to be held at the Smartforce Student Summit at IMTS 2020 on September 14-19.

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Lincoln Electric and the American Welding Society (AWS) have determined that a Standard and Credential already exists and are sufficient for the welding side of the competition since they are used at SkillsUSA's National Championship, as well as WorldSkills.

Proof-of-concept rounds of the competition were held in late April 2019 with community college teams involved in Alabama, Mississippi, and Louisiana. Fall 2019 rounds began in November at Hudson Valley Community College in New York, at Danville Community College in Danville, Virginia, and at Sierra College in California. In January 2020, ProjectMFG will return to Auburn, Alabama, and will

launch in Tennessee at the Tennessee Center for Applied Technology (TCAT).

For more information and to field a team of students or host an event at your school, visit [www.ProjectMFG.com](http://www.ProjectMFG.com) or contact Greg Jones, Vice President, Smartforce Development, AMT at 703-827-5203 or via email at [gjones@amtonline.org](mailto:gjones@amtonline.org).

Twitter: @ProjectMFG

YouTube: [ProjectMFG](https://www.youtube.com/ProjectMFG)

<p><b>ProjectMFG Competition Partners</b></p> <p>Department of Defense (DoD) Office of the Secretary of Defense Industrial Base Analysis and Sustainment Program (OSD IBAS)</p> <p>The Gene Haas Foundation • Haas Automation • Lincoln Electric</p>
<p><b>ProjectMFG Industry Partners</b></p> <p>The Gene Haas Foundation • Haas Automation • Lincoln Electric • NIMS</p> <p>AMT – The Association For Manufacturing Technology</p> <p>HFO Phillips • HFO Trident • HFO Allendale • HFO Selway • The Hoffmann Group</p> <p>Sandvik Coromant • CNC Software, Inc., Mastercam • Autodesk • Jergens, Inc. • Jorgensen Conveyors</p> <p>BIG Kaiser • Carl Zeiss Industrial Metrology • Hexagon Manufacturing Intelligence</p> <p>TCI Precision Metals • Blaser Swisslube • International Manufacturing Technology Show (IMTS)</p> <p>SME • SME Education Foundation</p>
<p><b>5-Axis Technical Standard Development Partners</b></p> <p>NIMS • AMT • Autodesk • Boeing • DMG Mori • Fanuc • Jergens, Inc. • Mastercam</p> <p>Sandvik Coromant • Vincennes University</p>

# SAVE THE DATES | NCATC 2020 EVENTS

[Learn more at ncatc.org](http://ncatc.org)

## NCATC Summer Workshop

**The Future of Work: Advancing Industry 4.0**

June 10–12, 2020

Hosted by  
Gateway Technical College  
Racine, Wisconsin



## NCATC Fall Conference

**Automation | Intelligence | Convergence:  
Our Industry 4.0 Workforce**

Sept 29–Oct 2, 2020

Hosted by  
Metropolitan Community College  
Omaha, Nebraska

