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NCATC National Coalition of Advanced Technology Centers
A Network of Advanced Technology Expertise

An affiliated council of AMERICAN ASSOCIATION OF COMMUNITY COLLEGES

From the Director ...

NCATC Friends and Colleagues,

As most of our members know, NCATC was founded nearly three decades ago by a public-private collaborative of industry and education partners with advanced technology and manufacturing expertise who were dedicated to delivering industry-responsive workforce development curriculum, programs, and initiatives. Since then, our ATC network of community and technical colleges has grown to over 170 members, including 32 corporate Strategic Partners. (View NCATC's Member Institution Map and Strategic Partners.)

NCATC's ongoing collaboration with many of the **Manufacturing USA Workforce and Education teams** allows us to share emerging technologies with our members to best prepare for "what's next" through our strategic ATC workforce development efforts. We continue to be actively involved with the activities of **America Makes** (3D/AM), **LIFT** (lightweight metals), **DMDII** (digital manufacturing & design), **NextFlex** (flex-electronics), **IACMI** (composites), **AIM** (photonics), **AFFOA** (functional fabrics), ARM (robotics), and **Power America** (advanced semi-conductors). I urge you to learn more about these Advanced Manufacturing Institutes.

NCATC also represents community and technical colleges on the **MForesight Workforce and Education Commission** led by renowned manufacturing workforce expert, Emily Stover DeRocco. NCATC is part of a diverse team responsible for collecting, sharing, promoting, and increasing the promising practices that our community and technical college members are involved with for advanced manufacturing workforce education and development with industry. At the annual **MForesight National Manufacturing Summit** in Washington, DC on July 25th, the report, *America's Next Manufacturing Workforce: Promising Practices in Education & Skills Building*, was released.

This year, NCATC is launching its first-ever **Innovative ATC Workforce Development Award** sponsored by NOCTI, a long-time NCATC Strategic Partner. NCATC and **NOCTI** would like to recognize outstanding workforce development professionals and industry colleagues who make a significant contribution to the education and training of today's advanced technology and manufacturing workforce. I encourage you to review the award criteria and nominate an innovative leader by the August 25th deadline.

The NCATC Board of Directors and staff look forward to seeing you at the **2017 NCATC National Events**. We return to a full 2-day, NCATC-focused **Annual Fall Conference** this year, hosted by **Portland Community College (OR), October 19-20, 2017**. The conference theme is appropriately titled, What's Next: Innovation-Driven Workforce Transformation. For more details, visit the NCATC 2017 Conference webpage or click here to REGISTER NOW!

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

J. Craig McAtee
NCATC Executive Director ◆

Students Leverage State-of-the-Art Facility

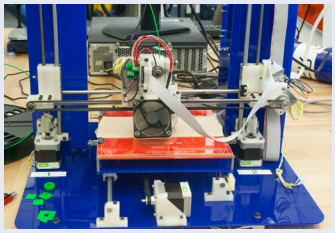
Students at Quinsigamond Community College in Worcester, Massachusetts, are reaping the benefits of increased lab space, a dedicated Fab Lab, and the latest high-tech equipment. Opened in January 2016, the 30,000-square-foot QuEST Center addresses the area's growing need for skilled workers in the fields of biotechnology, biomedical engineering, pharmaceuticals, advanced manufacturing, energy utility technology, mechatronics technology/robotics, and automation. Funding was provided through a $23 million state bond; grants supported equipment and fixtures. By collocating instruction and lab spaces for STEM discipline courses (science, technology, engineering, and math) with tutoring and other student support services in the QuEST Center, QCC supports integration and synergy across the disciplines.

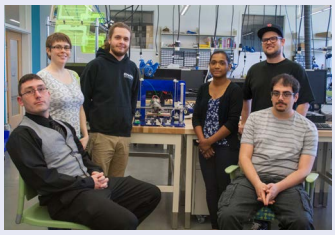
This semester several courses had final projects and exams that involved hands-on creation of technology.

"Many of these types of projects were done previously, but we are at a completely different level of depth, quality and complete integration with the curriculum now," said Kathy Rentsch, Dean of Business, Engineering and Technology. "Students are able to use these skills to continue their education, if they are seeking a bachelor's degree in engineering or related fields, or apply them directly to the workplace."

Following are examples of the work students have completed.

Creating 3D Printers—Students in Manufacturing Processes II built two 3D printers from kits, model Mendel 90. They ran into multiple challenges, as the instructions for the kits were not up-to-date and did not match the parts provided. Students had to problem-solve and re-engineer the process. While doing so, they also improved upon the original design.





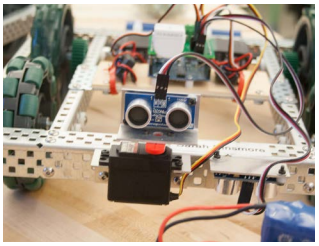
See "State-of-the-Art," page 2

• *"State-of-the-Art," continued from page 1* •

Students Make Stirling Engines—Students in senior level Computer Aided Manufacturing were assigned the task of building five Stirling engines. The team project included research and selection of design and use of parametric modeling software to re-engineer several designs. The team decided which parts needed machining and which could be manufactured using additive manufacturing equipment, such as 3D printing. Students designed fixtures, created the CNC programs, and ran machines to produce five copies of each machined component. They then assembled the parts, identified errors, and made corrections.

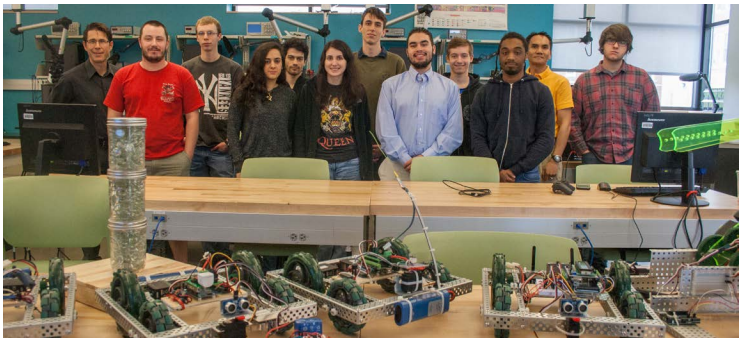
Energy Utility Technology Fair—The Energy Utility Technology program is designed to prepare students for advancement in the energy industry. Students can use this associate degree to advance in the workplace or transfer to a four-year program to complete a bachelor's degree. An Energy Utility Fair showcased student projects that demonstrated various energy sources including solar, electromagnetism, and steam.

Manufacturing and Mechatronics—The final project for Embedded Microcontrollers was to design, build, and program a microcontroller-based system using skills in electronic assembly and troubleshooting; drawing electronic schematics; and microcontroller programming. These skills are needed for careers as electronics, automation, mechatronics, and robotics technicians.



Projects included:

- Mobile robot controlled by a PS2 controller, with the ability to detect and avoid obstacles or to avoid driving off a table.
- A multicolored RGB LED lamp that can generate any color by mixing together various amounts of red, green, and blue light.
- A laser harp that sends out multiple laser beams in a fan pattern and plays notes based on which beam is interrupted.



For more information on the QuEST Center and these programs, please contact Kathy Rentsch at krentsch@qcc.mass.edu. ◆

Engineering Faculty Adviser Receives SWE Regional Award

Zach Srnis, Special Correspondent

(First published in The Collegian: A Student Publication of Lorain County Community College*; reproduced with permission)*

Ramona Anand, faculty advisor for the Society of Women Engineers (SWE) at NCATC member college Lorain County Community College, received the Region G Advancing Leader Award at the Society of Women Engineers Regional Conference at the University of Pittsburgh on Feb. 18. The award is given to a collegiate or professional individual who has been engaged in an engineering or technology degree, who has shown technical excellence, and who has engaged with SWE. The SWE chapter at LCCC is the first on a community college campus.

"I couldn't believe it when I heard the news," said Anand. "I immediately told my daughter the news. It was an exciting moment."

Anand is the founder of SWE at LCCC, which has been in the national spotlight as well with their webinar series that can be viewed on the college's website.

"Ramona has done a great job overseeing the student chapter," said Kelly Zelesnik, dean of engineering, business, and information technologies at LCCC. "The student chapter is the first of its kind for a community college."

The LCCC administration, the LCCC Foundation, and Zelesnik were all to thank due to their continued encouragement and support of SWE, according to Anand. SWE was implemented to encourage women in engineering, regardless of situation or background.

"There has been a great response to what Ramona has done," said Zelesnik. "The Science Technical Engineering and Math (STEM) outreach event, for example, has over 360 students that attended. We actually had to, unfortunately, turn some away because of the lack of space."

Zelesnik added that Anand's passion is teaching and she is well respected by her colleagues and students.

"She has a great knowledge of technology," said Zelesnik. "She is always learning and is committed to teaching the students what she knows. She is one of the hardest working people I know."

Anand has done a great job with coordinating the group and has done great things for the division as a whole, Zelesnik added.

SWE hosts several events on campus throughout the school year and recently announced their partnership with the United States Army to generate STEM awareness. At the beginning of March, SWE and the U.S. Army sponsored an Armed Services Vocational Aptitude Battery Career Exploration program to help undecided students discover their major.

"We hosted the STEM outreach event last October and it is something that we do annually," Anand added. "It serves as an outreach event and we invite students from other colleges as well."

Anand said that she loves her current teaching position at LCCC.

"I love teaching the students," Anand said. "They bring a positive energy and are very enthusiastic about learning and they always have new ideas." ◆

Manufacturer Holds Signing Day for New Recruits

Students to receive part-time jobs, full scholarships

We've all seen what happens when a well-conditioned athlete goes down on the field. The game stops. An entire stadium holds its breath. And the game suddenly depends on the quick reaction of a handful of personnel with specialized skills to diagnose, treat, and get that athlete back on the field.

The same can be said when a billion-dollar manufacturing operation suddenly goes down, and the advanced technical skills of a few team members are the only thing that can bring the whole automated process back to life. Michelin North America and Midlands Technical College in Lexington, SC, have created a partnership that treats students like athletes.

"The Michelin Tech Scholars program is one of Michelin's innovative approaches to workforce development. It is the perfect partnership between industry, K-12 education, and the Technical College System," says Michael Williams, Facility Personnel Manager for the Lexington passenger tire manufacturing plant. "Like college athletic 'signing days,' we're here to celebrate with this 'career signing day.'"

Modern manufacturing plants, like those at Michelin, are highly automated operations where production line downtime can cost thousands per hour in lost productivity. Mechatronics technicians keep the production lines functioning at the highest capacity.

Eight students from area high schools in Lexington County were chosen as Michelin Technical Scholars. The students received baseball caps signifying they were joining the Michelin team and signed contracts. In fall 2017, they will enroll in Midlands Technical College's Electronic Engineering Technology and Associate in General Technology (Mechatronics) degree programs.

"Michelin relies on the great employees that come from Midlands Technical College," said Williams. "If we as a company expect highly competent employees, it's important that we support programs that provide advanced technical training."

The students, through Michelin's Technical Scholars program, will receive full scholarships covering their tuition, fees, and books. The students will also work part-time at Michelin, earning on-the-job training and experience in their chosen field. Each of the students selected for the program has exhibited the potential for a career as a technician with Michelin.

"These students are signing with Midlands Technical College as well as Michelin," said MTC President Ronald L. Rhames. "We are very proud to welcome these outstanding individuals to the MTC family. MTC and Michelin North America have a proven history of partnerships. MTC provides technically minded students with the best education possible. Michelin provides the scholarships that help those students succeed. I hope this signing day is the first of many more we will celebrate for years to come." ◆

Cuyahoga Community College Youth Robotics Team Wins National Championship

Karen Farkas, cleveland.com (First published at cleveland.com; reprinted with permission)

Students from Cuyahoga Community College's Youth Technology Academy won the FIRST Robotics Competition Championship, an engineering skills showcase in St. Louis that drew 20,000 participants from around the world.

The Tri-C team—comprising more than two dozen Cleveland Metropolitan School District students—joined with three other U.S. schools to form the winning alliance. They are the first Ohio team to win the competition. More than 40,000 cheering spectators watched the championship match on April 30 at The Dome at America's Center in St. Louis, which hosted the four-day event.

"This was a phenomenal ending to a fantastic robotics season," George Bilokonsky, executive director of Tri-C's Youth Technology Academy, said in a statement. "We are extraordinarily proud and truly inspired by these bright and talented students who worked so hard to triumph."

The winning alliance featured students from Tri-C as well as schools from California, Illinois, and Virginia.

Where are the Tri-C students from? Students on the team represented seven Cleveland high schools: MC2 STEM, East Tech, John Adams, John Marshall, Design Lab Early College, New Tech West, and John Hay. More than 75,000 high school students from 24 countries competed in the event in the four months leading to the championship.

How does FIRST work? The competition—now in its 25th year—is designed to introduce high school students to potential careers in engineering, science, and technology. The theme this year was a medieval castle theme, FIRST STRONGHOLD.

Teams of students worked with professional mentors over six weeks to design and build a robot to compete. Robots scored points by breaching opponents' defenses and tossing boulders through goals in their tower. Students built the remote-controlled robots—which could weigh up to 120 pounds and stand 4 feet 6 inches tall—using kits with more than 300 parts.

How did they get to the finals? The group competed in 18 matches while advancing through the championship tournament.

The Tri-C team competed in regional robotics competitions in Cleveland, Cincinnati, and Palmetto, South Carolina, before advancing to the championship.

Who sponsored the team? NASA Glenn Research Center in Cleveland sponsored Tri-C's team. NASA engineer Larry Oberle worked with students as they developed their robot. He has been involved with the program for 14 years.

The team also received support from numerous companies, foundations and other sponsors.

To learn more about FIRST, go to firstinspires.org. ◆

FLATE Offers New Acceleration Pathways in Manufacturing

This summer the Florida Department of Economic Opportunity (DEO) and the Florida Department of Education (FLDOE) added several NIMS (National Institute for Metalworking) credentials to the state's secondary school funding list. We are excited to have these new acceleration pathways for students in manufacturing career programs. Anyone who holds these current NIMS credentials can get credit toward several two-year degree programs that support Florida's manufacturing industry sector, including the AS Engineering Technology. Other credentials that validate knowledge and skills that have previously been approved for statewide articulation include credentials for 3D modeling and design, electronics, quality, sheet metal fabrication, composite materials, welding, aviation maintenance, and more.

Along with its partners, FLATE proposed the first statewide articulation with the Manufacturing Skills Standards Council (MSSC) Certified Production Technician (CPT) to the AS Engineering Technology in 2007 and has worked closely with industry since then to be sure that Florida students and people in the workforce who wanted to continue their education in manufacturing could get credit for skills and knowledge they already had. In Florida, industry credentials articulate for up to fifteen credits toward technical degrees, providing credit for prior learning based on skills attainment documented by credential-offering organizations. The robust, long-established system in Florida started with the Career and Professional Education Act (CAPE) in 2006, has expanded to include workforce credentials for the postsecondary level, and brings performance funding to all participating institutions. You can learn more about the AS Engineering Technology Degree and its system of stackable credentials and certification alignments at http://fl-ate.org/programs/stackable-credentials/.

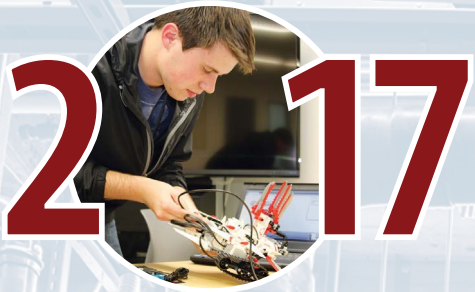
The State of Florida's Office of Articulation in the Department of Education has a mission to facilitate effective and efficient progression and transfer of students through Florida's K-20 education system. Articulation processes provide acceleration opportunities for students to complete postsecondary degrees (AA, AS, or bachelor's level). There are basically two methods. First, students can earn credit by examination through which a student successfully shows mastery of the material by achieving above the passing "cut score." These examinations could be any number of nationally or internationally recognized assessments for academic or career courses and/or programs. The second acceleration method is dual enrollment. This process allows secondary students (including home school students and students with disabilities) to take postsecondary coursework and simultaneously earn credit toward high school diplomas, career certificates, industry certifications, or associate or baccalaureate degrees at Florida public or private institutions. Many resources, including agreement templates and guidelines, are available at http://www.fldoe.org/policy/articulation/.

Several other policies support Florida's educational pathways. Common course numbering in all postsecondary institutions, statewide articulation agreements, common prerequisites, and general education core all facilitate smooth transfers between secondary and postsecondary institutions. In the world of career and technical education (CTE), the State Board of Education has approved the listed statewide career and technical education articulation agreements, which are based on industry certification. These articulation agreements provide a minimum guarantee of articulated credit. Institutions can elect to grant additional credit based on local agreements. The process for adding credentials to the statewide list is illustrated in the table below.

Typical Date	Activity
Aug 15–Sept 30	Submission of new credential applications to CareerSource Florida for following academic year. Applications can be submitted by regional workforce boards or school principals with endorsements from each category: (1) Florida-based state or regional business/trade association; (2) local workforce board; (3) economic development organization.
Nov–Feb	CareerSource Florida, Florida Department of Education, Department of Economic Opportunity, Department of Economic Opportunity, industry associations, Florida businesses, and other pertinent groups review applications for eligibility and recommendations.
Mar 1	CareerSource Florida Board approves a list of recommended industry certifications no later than this date.
Mar 5	Florida Department of Education releases the preliminary "CAPE Industry Certification Funding List."
Mar 5–April 1	Districts may submit requests for an addition to the "CAPE Industry Certification Funding List."
Aug 1	Florida Department of Education releases the final "CAPE Industry Certification Funding List."

These FLDOE processes are subject to current Florida statutes and rules. ◆

Mark Your Calendar!



October 19–20
Portland, Oregon

NCATC Fall Conference

What's Next: Innovation-Driven Workforce Transformation

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