

MONROE COUNTY COMMUNITY COLLEGE

TECH UPDATE

NEWS FROM THE APPLIED SCIENCE AND
ENGINEERING TECHNOLOGY DIVISION

www.monroecc.edu

VOLUME 15 | ISSUE 2

WINTER 2020



MCCC
Awarded NSF
"Collaborative
Research" Grant

MCCC Makerspace Hosts its First Live, Virtual Entrepreneurship Guest Speaker

The Monroe County Community College Makerspace hosted its first virtual workshop via Zoom titled "Make & Innovate" with special guest speaker David Ollila, founder of Invent@NMU. Ollila discussed the difference between inventing and innovating, what it takes to be an entrepreneur, and how facilities like the MCCC Makerspace can help take an idea and grow it from concept to functional prototype. Ollila's presentation was followed by a quick virtual tour of the MCCC Makerspace, showcasing the workspace and equipment, including some new Creaform Ender 3-V2 printers that the college recently received.

The fall semester brought not only a change in the weather, but a small increase in Makerspace activity as well. The Makerspace had its first non-student members stopping in regularly from the community, and so far the CNC laser has been a big hit. Staff has worked on projects ranging from custom laser cut and engraved medals for an entire cross country team (laser cut and engraved), to face masks laser cut from old t-shirts, to a Halloween-themed laser cut shadow box for a school project.



The City of Monroe creates Registered Electrical Apprenticeship Program

In February 2020, officials from the city of Monroe, the U.S. Department of Labor Office of Apprenticeship and MCCC gathered for the official signing of the city's Registered Electrical Apprenticeship program. Their first apprentice began taking courses at MCCC in the fall of 2020 and will complete his program at the end of the 2020 Winter Semester.



MCCC SECURES SECOND NSF GRANT IN LESS THAN THREE YEARS



Monroe County Community College secured its second six-figure National Science Foundation grant in less than three years. The \$105,027 grant is for a three-year project titled “Collaborative Research: Improving the Educational Experiences, Outcomes and Career Pathways of Welding Technology Students.”

The college was awarded a \$224,906 NSF grant in the spring of 2018 for a project titled

“Advanced Welder Education” with the goal of increasing the region’s supply of qualified welders with advanced levels of education who can further research, development and innovation in the field.

MCCC is a sub-grantee for this grant; the University of Michigan is the fiduciary of the overall grant of \$799,982, said Parmeshwar (Peter) Coomar, dean of the Applied Science and Engineering Technology Division at MCCC and the college’s lead on implementing the grant project. In addition to U-M, MCCC is partnering on the grant with Wayne State University and Macomb Community College.

According to Coomar, the demand for welding personnel has steadily increased, but welding graduates are on the decline. As significant producers of welding personnel, Southeast Michigan colleges have challenging workforce development needs and diverse student populations.

This project will help colleges to better understand what factors influence the experiences of welding students, what promotes their graduation and matriculation to welding career pathways, and how the expectations of students, instructors and employers align with welding industry needs, Coomar said. He added that it will build a research collaboration among faculty, administrators at UM, MCCC, WSU and MCC.

The specific goals of the project are to:

- Document the educational, personal and professional experiences of welding technology students and how their experiences affect their career decisions;
- Understand welding faculty and employers’ expectations of students and graduates; and
- Identify obstacles and issues that contribute to student attrition or lack of matriculation.

Coomar said the grant project will have a broad impact by helping “faculty and administrators understand and apply practices that support students to ensure the growth of a generation of technically-skilled welders.”

CONTACT INFORMATION

DEAN

Parmeshwar Coomar
pcoomar@monroeccc.edu
734-384-4209

APPRENTICE PROGRAMMING

Parmeshwar Coomar
pcoomar@monroeccc.edu
734-384-4209

AUTOMOTIVE ENGINEERING

Chris Sweeney
pcoomar@monroeccc.edu
734-384-4284

AUTOMOTIVE SERVICE

Parmeshwar Coomar
pcoomar@monroeccc.edu
734-384-4209

CONSTRUCTION MANAGEMENT

Parmeshwar Coomar
pcoomar@monroeccc.edu
734-384-4209

ELECTRONICS/ELECTRICITY

Alex Wan
mlocher@monroeccc.edu
734-384-4116

MECHANICAL DESIGN

Dean Kerste
dkerste@monroeccc.edu
734-384-4121

MECHANICAL ENGINEERING

Martin Dubois
mdubois@monroeccc.edu
734-384-4120

NUCLEAR ENGINEERING TECHNOLOGY

Martin Dubois
mdubois@monroeccc.edu
734-384-4120

PRODUCT & PROCESS TECHNOLOGY

Troy Elliott
telliott@monroeccc.edu
734-384-4114

QUALITY SYSTEMS & METROLOGY

Parmeshwar Coomar
pcoomar@monroeccc.edu
734-384-4209

RENEWABLE ENERGY

Parmeshwar Coomar
pcoomar@monroeccc.edu
734-384-4209

MATERIALS TECHNOLOGY & NDT

Mark Jager
mjager@monroeccc.edu
734-384-4165

WELDING TECHNOLOGY

Stephen Hasselbach
shasselbach@monroeccc.edu
734-384-4118

Auto Tips: Tune-Up and Maintenance for Your Car

As we enter the winter season and the temperatures start to drop, the Automotive Service and Engineering Technology program faculty and staff would like to offer drivers tips to keep their vehicles dependable throughout the year.

The one thing that most people notice first is the tire pressure monitor light illuminating at the first significant drop in overnight temperature.

Tire pressure warning systems were mandated in 2007 on all light duty motor vehicles (under 10,000 pounds GVW) sold after September 1, 2007. TPMS alert drivers of an under-inflation event of one or more tires. Normal tire pressure specifications are from 30 to 35 PSI on most vehicles. Light trucks and SUV's could be more.

Cold temperature effects tire pressure. For every 10-degree drop in temperature, a tire pressure decreases one PSI. A 30-degree drop in temperature could drop the tire pressure below the threshold of the manufacturer's specified pressure and illuminate the TPMS light on the dash.

Drivers should check their tire pressure against the manufacturer's specifications on the placard on the pillar of the driver's door at least once a month. If tire pressure drops 25 percent below the manufacturer's specifications, the low tire warning light or message will appear on the dash. For example, if the recommended



cold tire pressure is 35 PSI as shown in the placard to the right and your actual tire

pressure is 30 PSI and the outside temperature drops 30 degrees, this would cause an additional tire pressure loss of 3 PSI and your tire pressure would be 27 PSI. The tire pressure monitor is set to alert the driver when tire pressure drops below 28 PSI. A 27 PSI pressure would turn on the warning light or message to alert the driver.

For more questions, please feel free to contact the Automotive Department on campus at 734-384-4145.

TIRE AND LOADING INFORMATION			
SEATING CAPACITY: TOTAL 4 FRONT 2 SECOND 2 THIRD 0			
The combined weight of occupants and cargo should never exceed 192kg or 423lbs.			
TIRE	SIZE	COLD TIRE PRESSURE	SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION.
FRONT	275/35ZR18 Z	210 kPa, 30 PSI	
REAR	325/30ZR19 Z	210 kPa, 30 PSI	
SPARE	NONE	NONE	

MCCC ASSISTANT PROFESSOR PRESENTS AT INTERNATIONAL CONFERENCE AND ANNOUNCES NEW TRANSFER AGREEMENT WITH WSU

Mark Jager, assistant professor of welding and material technology, presented his research on the influence of technological parameter of the handing and sintering process on the structure of iron-based powders virtually at the Metal 2020 Conference hosted by the Czech Republic this spring. He presented his research along with Agnieszka Stanuala, Wirginia Pilarczyk and Tomasz Wilk.

In October, Jager also co-hosted with Parmeshwar Coomar, dean of the ASET

division at MCCC, a virtual event with Wayne State University about a new 2+2 transfer agreement for welding students who are interested in pursuing a bachelor's degree. The transfer agreement will allow graduates of MCCC's associate degree in welding to seamlessly transfer their first two years of credits toward pursuing a Bachelor of Science degree in welding and metallurgical engineering technology, representing a significant savings in tuition costs for students.



MONROE COUNTY
COMMUNITY COLLEGE

enriching lives

MCCC Now a FANUC-Certified College, Qualifying Graduates for High-tech Employment



are taught CNC programming using FANUC's NC Guide simulation software on a PC or FANUC's CNC education simulators for an extensive, hands-on experience. Students are also exposed to machines incorporating FANUC CNC controls to experience the complete programming, setup and operational workflow. Throughout the process, students follow approved curriculum for milling to ensure consistency, and instructors attend FANUC courses for control training to ensure quality and knowledge of the control.

"As a result of being a FANUC-certified education CNC school, Monroe County Community College is offering a CNC program that answers the demand from the manufacturing industry for skilled FANUC CNC operators and programmers. Graduates will be able to read and interpret blueprints, develop the required process for the blueprint, determine machine coordinate values, develop CNC code, test the NC programs, QC the part and implement the part into production," said Troy Elliott, instructor of manufacturing technology.

The Manufacturing Program in the Applied Science and Engineering Technology Division is now a FANUC-certified Education CNC training facility offering students industry-recognized credentials toward manufacturing technology degrees. Upon graduation, students are qualified to work in manufacturing with FANUC CNC equipment.

MCCC is now certified to provide FANUC's CNC programming, setup and operation training for milling machines. This curriculum can be incorporated into existing manufacturing technology programs that also focus on English, mathematics, blueprint reading, machine processes, measuring (GD&T) and machine shop safety. Students are qualified throughout the education process to ensure competency through several avenues: enrollment application, testing during courses, and final comprehensive and certification exams. Initially, students



MCCC MANUFACTURING LAB ADDS FOURTH AXIS

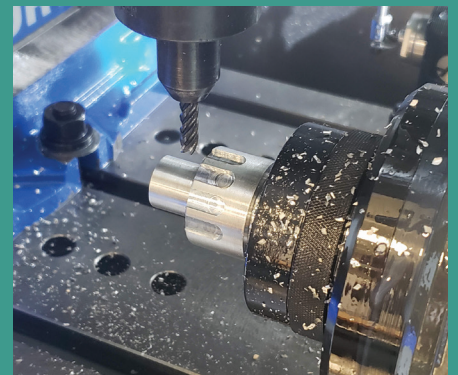
Keeping up with industry standards, MCCC's CNC Lab added a fourth axis rotary table to one of its HAAS machining centers. With this fourth axis, students will be able to see firsthand the fastest way to increase the productivity of a machining center.

The benefits include increasing part accuracy by reducing the number of times a part is handled by combining operations. The machine operator will have the ability to reduce or eliminate

multiple setups and easily handle machining multi-sided parts (3+1 machining). Having the capability to run multiple sides at one time will reduce the number of times the tools will need to return to the tool changer and increases unattended machining time, freeing up the operator to do other things.

Students will also have the ability to run fully interpolated, complex four-axis programs. Having a fourth axis will be a powerful addition to the CNC Lab. It will

enable the students to learn a variety of new machining techniques.



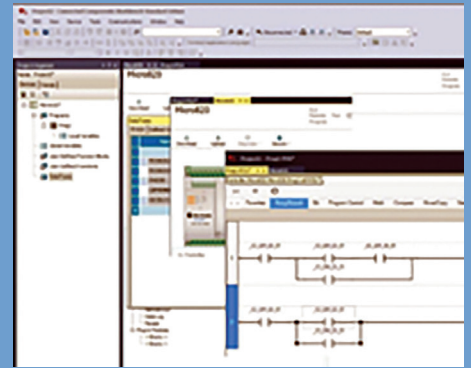
Robotics Lab gets NEW PLC Trainers

The ASET division at MCCC has obtained new Programmable Logic Controller Trainers for use in PLC and automation courses through the federal Coronavirus Aid, Relief, and Economic Security Act Funding due to the coronavirus. The PLC and automation classes are very hands-on, and students need to be able to program and troubleshoot. The trainers feature the Micro 820 PLC from Rockwell Automation that are the newest line of PLCs from Rockwell. These controllers support up to 36 I/O points with many embedded features such as ethernet, a microSD slot for recipe and data log, and analog I/O.

The PLCs are programmed and monitored using Rockwell



Automations Connected Components Workbench software, also known as CCW software. The latest version includes a built-in software simulator,



meets the IEC 61131 PLC standard and is open source.

The trainers were loaned to students to use at home, giving them the opportunity to work on their PLC assignments off-campus. Not only does this facilitate social distancing, but it also gives students more opportunities to work on their own.

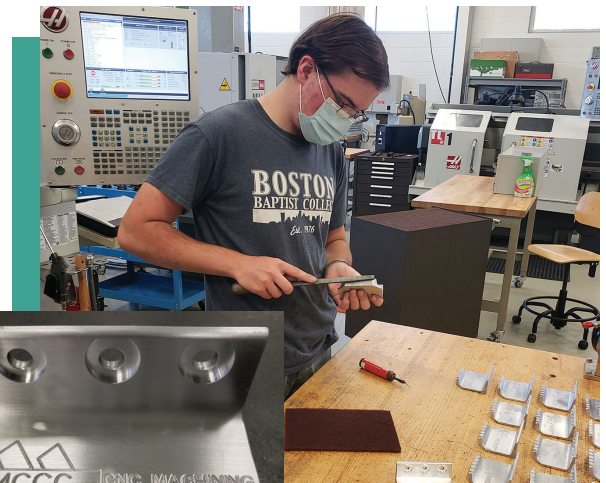
Manufacturing Lab Shifts to PPE Production

When the stay-at-home order was issued last March, it did not shut down the CNC Lab at MCCC. Instead, it gave employees the opportunity to shift gears and help with the fight against COVID-19. In a short amount of time, manufacturing technology instructor, Troy Elliott, and Lab Technician Bob Semanske transformed the CNC Lab into a production environment. All three machining centers in the lab were setup with fixturing and tooling to produce face shields to help support front-line workers.

Due to the stay-at-home order, students were not allowed on campus, but through remote learning, they were given the opportunity to see firsthand how to process a job in an industry-type setting. Students in MECH 201 (CAD/CAM Milling I) were given a three-dimensional model that they downloaded into Mastercam, allowing them to create toolpaths to perform the required machining operations. The G-code programs were transferred to the machining centers where the production was performed. As a result, MCCC was able to manufacture and donate nearly 100 face masks to local front-line workers and campus employees.

In addition to the face masks, the CNC Lab also produced two dozen toe-pulls for bathroom doors around campus. The toe-pulls mount on the bottom of an inward swinging door

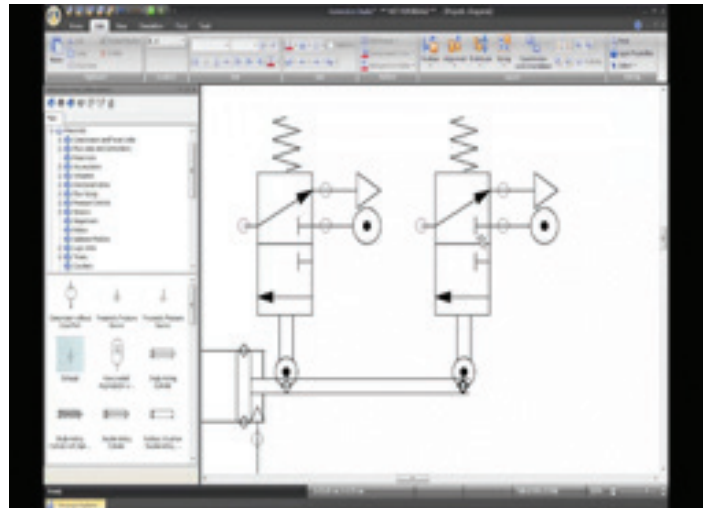
and allow the occupant to open the door by using their toes to pull the door open for a hands-free exit. Having seen these in hospitals and local restaurants, Elliott knew these would be easily machined in the CNC Lab on campus. MECH 105 (CNC II) student Sam Mohn was able to help finish the toe-pulls when students returned on a limited basis to campus for the fall semester.



Automation Studio Expanded at MCCC ASET Division

The ASET division has expanded its licenses for Famic Technologies' Automation Studio. Automation Studio is a unique design and simulation software covering all project/machine technologies, including fluid power, electrical, controls, Human Machine Interface and communications through the entire product lifecycle. It helps to easily combine these various technologies in order to design, document and simulate complete systems.

Previously, the division used two seats of Automation Studio for evaluation and training. This semester, the ASET division expanded to a server-based system that students can download at home and check out licenses directly from Famic as needed. This remote-access capability enables teachers and students to use the software from school and from home. They can now prepare courses, do homework, and perform simulations wherever they are. This powerful software will be utilized in fluid power, automation and PLC courses.

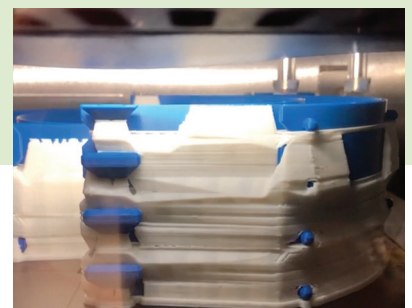
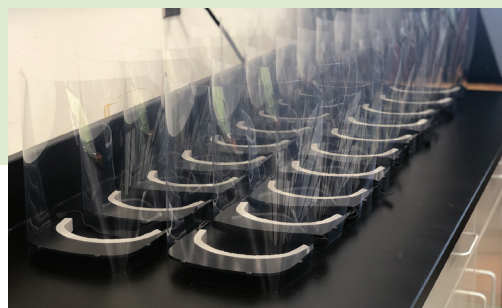


Automation Studio was funded by the CARES Act.

MCCC Makerspace Produces Emergency PPE for COVID Frontline Workers

At the end of March 2020, MCCC was suddenly preparing to shut down all on-campus operations and transition to an entirely remote learning format for the remainder of the semester. For ASET technician Mike Reaume and the MCCC Makerspace, however, things were about to get busier than ever. Within a few days of switching to the "new normal" of working remotely and all-online classes, members of the ASET division began asking themselves how they could best use their existing resources to help combat the COVID pandemic.

With personal protection equipment in extremely short supply, the 3D printers in the Makerspace were quickly put to use to produce various prototypes, and eventually several hundred factory-quality face shields were provided over the remainder of spring and summer. While Reaume singlehandedly took care of operations within Makerspace, additional shields were produced by CNC instructor Troy Elliot with help from welding lab technician Robert Semanske. Additional help was also provided by ASET dean Peter Coomar to help secure much needed supplies and to coordinate distribution of donations. In total, more than 400 shields were produced and donated, along with thousands of other PPE items that were purchased for donation.



ASET Division Hires 2 New Full-time Faculty

Christopher Sweeney was hired as MCCC's new assistant professor of automotive engineering in the Applied Science and Engineering Technology Division in August. Sweeney graduated from the University of Cincinnati with bachelor and master degrees of science in mechanical engineering. After graduation, he moved to Michigan and took a position with Ford Motor Company as a development engineer specializing in Powertrain NVH.

Since 2009, Sweeney had been teaching part-time at Washtenaw Community College in the Math Department. In the fall of 2016, he began teaching for Jackson College in its Corrections Education Program at the Women's Prison in Ypsilanti. He noted of his adjunct teaching experience: "It has been very rewarding personally to be able to give back to those less fortunate in our society."

In his spare time Sweeney and his significant other take care of two (littermates) 60-pound dogs they rescued from the Humane Society. He also enjoys traveling up north and participating in half marathons and shorter triathlons.

Nien-Chu (Alex) Wan, assistant professor electrical engineering, was also hired in August. He came to MCCC with more than 20 years of experience as an engineer in hybrid electrical vehicle assignments. Being an educator is his passion. Wan holds an engineering degree from the University of Michigan. Outside of work, he enjoys travelling with his family and watching football.



Christopher Sweeney



Nien-Chu (Alex) Wan

National
APPRENTICESHIP WEEK

NOVEMBER 8-14, 2020

**BUILDING SKILLS,
EXPANDING OPPORTUNITY**

National Apprenticeship Week (NAW) in November was a nationwide celebration that brought together business leaders, career seekers, labor, educational institutions and other critical partners to demonstrate their support for apprenticeship. NAW also provides apprenticeship sponsors with the opportunity to showcase their programs, facilities and apprentices in their community. The week-long celebration highlighted the benefits of apprenticeship in preparing a highly-skilled workforce to meet the talent needs of employers across diverse industries.

MCCC ASET Adjunct Receives Poly Works Certificate

Mike Taylor, metrology adjunct, is a trained poly works inspector for the metrology and quality program. Poly Works is a software that is used with the program's Romer Arm that offers hard probing as well as laser scanning capabilities for quality inspection and reverse engineering.

Mechanical Design Students Receive 3D Printers for Home Use

MCCC Mechanical Design Technology program students who were enrolled in the Rapid Prototyping course during the fall semester each received a 3D printer for home use during the COVID-19 pandemic. The 3D printers were funded through the federal Coronavirus Aid, Relief and Economic Security Act.

The 3D printers purchased through the CARES Act were Ender-3 V2s. The Ender-3 V2 printers were released for sale to the general public in June 2020. The printer is considered a budget-friendly FDM (fused deposition modeling) 3D printer with features and capabilities of high-end, industrial grade printers. "Having used industrial-grade 3D printers that cost tens of thousands of dollars, I cannot say enough about the Ender-3's capabilities and print quality. The Ender-3s are amazing little workhorses for the price. I am confident you cannot find a better 3D printer for less than \$300," said Dean Kerste, professor of mechanical design technology.

In the college's rapid prototyping course students learn about many different types of printing technologies, along with printer precision, resolution and material capabilities. The students use SOLIDWORKS, the industry standard 3D modeling computer-aided-design software, to design and redesign products for 3D printing. The 3D prints are then analyzed by the students for multiple quality checks like layer adhesion, alignment, dimensional accuracy and surface finish. "Budget-friendly printers for home use always require more troubleshooting, maintenance and oversight than industrial grade printers. I believe this added a nice component to the rapid prototyping course. In a

face-to-face class, even though these topics are discussed, students normally do not receive hands-on experience troubleshooting common 3D printer issues," said Kerste.

Because the printers arrived in an unassembled state, Mike Reaume, CAD technician, held a 3-hour, hands-on lab to guide the students in the assembly of the printers. The printers will be returned at the end of the semester to be used by future students. "Even though teaching a hands-on course is not ideal in an online setting, I believe the online curriculum along with the CARES funded 3D printers provided for a robust and well-rounded learning experience for the students. I can't say how grateful I am for this funding...it made all the difference in the class," said Kerste.



HIGH DEMAND, HIGH WAGE CAREER OPPORTUNITY: MACHINIST

According to the State of Michigan's Bureau of Labor Market Information and Strategic Initiatives there will be over 2,500 annual openings for machinists in Michigan in the next five years. Machinists make \$20 – 29 per hour in southeast Michigan.

MCCC offers both a certificate program (generally one year of study) and an associate of applied science degree in machining. Both programs are designed as career programs for entry into jobs after completion. In addition, MCCC has transfer

agreements with University of Toledo, Wayne State University, Eastern Michigan University, Ferris State University, Lawrence Technological University, Michigan Technological University and Siena Heights University that allow direct transfer of MCCC credits toward completion of an applied science bachelor's degree, saving students thousands of dollars.

For more information about ASET and other high-demand, high-wage programs at MCCC visit www.monroeccc.edu/highdemand.



For all ASET Division
Winter 2021 Courses
please go to:
www.monroecc.edu/registration



MONROE COUNTY
COMMUNITY COLLEGE

enriching lives

QUESTIONS ABOUT THIS PUBLICATION

CONTACT:

Parmeshwar Coomar, Applied Science
and Engineering Technology Division
pcoomar@monroecc.edu
734-384-4112 or

Joe Verkennes
Editor/Director of Marketing
and Communications
Monroe Community College
jverkennes@monroecc.edu
734-384-4201