

THE CHANGING FACE of Technical Career Pathways in Higher Education

Creating a bridge between education and employment.



Kyle Constant at his job at Community Manufacturing Solutions in Kingston, NY. Kyle is an Advanced Manufacturing student at SUNY Ulster.

More now than ever before, students are challenging the structure of traditional education for emerging technical careers. They are demanding that educational institutions provide a robust quality learning environment that include concepts such as real-world classrooms and opportunities for internships and apprenticeships. Students want to know that the programs being offered will prepare them for the current labor market. Credit for prior learning, micro credentials and digital badges are all becoming common language in the field of education.

Why the change? Technology has advanced exponentially in the past 30 years. With this rapid growth, there has been a change, particularly in how we learn and why we want to learn. Learning is instantaneously available at our fingertips. But how does the

employer value the education? From the employer's perspective, potential workers are seen as capital, based on their knowledge, their social skills, personality attributes and creativity. Degrees become somewhat replaced by competency based knowledge. Employers are asking for a summary of work experience relative to those competencies that are important to the company and to the job as they staff a much different workforce than they did 30 years ago. This drives the employee to look at their skills gap and how they can retool using short-term credentials to make them more attractive to employers. Education institutions are starting to find different and better ways at creating a bridge between education and employment.

SUNY Ulster has been fortunate to have tools available to start creating this bridge in the advanced manufacturing sector.

Several years ago, SUNY Ulster envisioned a better linkage between local industry and the college. As the College started offering more technology programs, there was a need for local industry to have more interaction with the students and there was a need for the students to have access to better labs and more equipment. In 2017, SUNY Ulster built the Pfeiffer Technology and Innovation Lab. This lab was designed to foster and support collaborations between education and the advanced technology and manufacturing industry. 3D printers, 3D scanners, a laser cutter, programmable logic controller training stations and state of the art computers were added to enable students to work collaboratively among programs and with industry. The vision for the center is that local companies would work hand-in-hand with students on manufacturing problems, as well as, new designs resulting in students engaging fully with the academic learning via hands-on learning. This in turn would lead to a relationship between students and local employers encouraging the students to find local employment upon graduation. To date, several companies have worked with SUNY Ulster students to help solve manufacturing problems and help design better products. In addition, the Pfeiffer Technology and Innovation Lab has fostered partnerships between academic disciplines resulting in a clear picture of how interrelationships between departments in corporations requires good communication skills and embraces team building skills.

This past year SUNY received funding as part of the Governor's initiative to create up to 2,000 advanced manufacturing and



Apprentice Keanu San Millan with Frank Falatyn at FALA Technologies.

healthcare jobs by creating pre-apprenticeship and registered apprenticeship positions. To kick-off these programs locally, SUNY Ulster hosted a well-attended Roundtable in October 2018 where employers could share their employment concerns and representatives from the New York State Department of



Anything. Anywhere.
**Providing Rigging and
 Transportation Solutions
 for Manufacturers**



cnc tools • presses • lathes • boilers • heaters • air handling units • generators • printing presses • machine shops
 sculptures • safes • semi conductor equipment • manufacturing equipment • production line relocations

800-633-6683

arnoff.com/logistic-solutions

Contact us for a free consultation

Labor could share the opportunity for employers to participate in the apprenticeship initiative. SUNY Ulster was awarded funding to support these initiatives and is able to offer registered apprentices \$5,000 worth of training at the College using these grant funds resulting in no-cost training to the employee or the employer. Courses currently available under this initiative include Programmable Logic Controllers (PLCs), Computer Numerical Control (CNC) Operator and Programmer, Blueprint Reading, GD&T, CAD, Mathematics for Manufacturing, MasterCam, Metrology and Fundamentals of Electricity. Many of these courses can be taken for credit allowing an apprentice to work on their degree at the same time as they build their skills on the job.

better job in the company. Others are students looking to gain employment with a local manufacturing firm. Part of the pre-apprenticeship program is to expose students to different careers in local manufacturing firms.

Using a prior learning model, SUNY Ulster is able to evaluate the learning students have already done on the job and compare that learning to the learning outcomes in coursework leading to a certificate or a degree and award credit where the learning outcomes have been met. This model opens doors for students that don't have a lot of time to take heavy course loads due to family and work commitments but, are looking for a degree to advance themselves into a better paying position. If they can

successfully document and show that the learning outcomes have been met, credit will be given for work already completed shortening the completion time to the degree being awarded.

Another concept that SUNY Ulster has successfully piloted is a blended class consisting of degree-seeking and non-degree seeking students. Using a common teacher, the learning outcomes for the course are dictated by the course syllabus for the degree seeking students. All students pay the credit equivalent price for the course and all students take assessments. Students that register for a non-credit course have the option at the end of the course to have their course work evaluated against the learning outcomes of the degree course and in most cases since the assessments have been completed credit can be awarded. It has been shown that students like the option as the stress of the grade is removed. The student is able to relax and enjoy the class and in most cases asks for the credit before the class has been completed. This model works well for students who did not excel

in high school as well as for those students who have been away from the academic arena for some time.

SUNY has given the green light for campuses to start developing micro credentials. Micro credentials are a set of courses that lead to a mastery of or competency in specific knowledge, skills or processes that can be measured against a set of acceptable standards. As SUNY Ulster develops courses in advanced manufacturing, micro credentials in the areas of CNC, Metrology, Welding, CAD and Mechatronics are under development. Micro credentials have value for both employers as well as the learner. Micro credentials present an economical way to develop skill sets that might be needed due to change in technology or change in a job. The learner can easily demonstrate that the skills were learned by showing the micro credential on their resume. At the same time, program designers and instructors, by paying attention to learning outcomes and competencies, might be able to place the same micro credential in the framework of several programs. Micro credentials are stackable credentials, meaning that each stacks into a larger framework leading to a degree. A recent workforce analysis by Burning Glass reported that "hybrid" jobs or those that require skill-set from multiple academic programs



Apprentice Norm Imperati at FALA Technologies.

Another concept that SUNY Ulster has successfully piloted is a blended class consisting of degree-seeking and non-degree seeking students.

In addition, SUNY Ulster was also awarded funding on this initiative to offer a pre-apprenticeship program for those looking to connect with a local manufacturing firm. For many young adults, these are the first courses in advanced manufacturing that they have taken. The pre-apprenticeship program includes basic skills building courses including: Mathematics for Manufacturing, Blueprint Reading, Introduction to Manufacturing, Hands-on Lab and Workplace Success Skills. All courses are taught by those working in the manufacturing field who know the importance of building a career pathway into good manufacturing jobs. Some employers choose to send promising employees to these classes so that they can build their skills and move up the ladder to a

are growing nearly twice as fast as jobs overall. Micro credentials allow students to blend courses from several academic disciplines into a career path that meets their career goals. At the same time these micro credentials can be taken after the learner has a degree to achieve higher paying positions.



Dr. Mark Stewart, Assistant Professor of Engineering Science, SUNY Ulster in the 3D printing lab.

Last year, SUNY Ulster unveiled their AdultEDge program, specifically targeting students over 24 years old. Though traditional advanced manufacturing programs are not included under this initiative, business courses are. Currently an online Business Administration AS degree, Business and Entrepreneurial Studies AAS and an Entrepreneurship Certificate are available. AdultEDge programs are offered in evening, accelerated and online formats on either a part time or a full time basis. One-stop shopping is available as a personalized academic plan is developed for each student based on previous academic achievement and learning acquired through work and life experience.

Recently SUNY Ulster received scholarship money from Haas Foundation for students entering into a CNC or a Mechanical Engineering training program. The college was able to award 6 students scholarships towards their education in these areas. Through the College Foundation, the SUNY President's Challenge Scholarship funds higher education to motivated 8th graders throughout the county. First generation college-bound students are mentored to overcome barriers associated with attending college. This scholarship is seen as a solution to students' first obstacle – how their education will be funded. School guidance counseling and mentoring services are provided by the sponsoring schools. The result is that first generation students are now given support and encouragement to attain a college degree.

SUNY Ulster has also developed a career path for young adults with high-functioning autism (HFA). By replicating a model that is working in California and working closely with The Arc of Ulster-Greene, SUNY Ulster created a career pathway consisting of core skills classes of Mathematics for Manufacturing, Blueprint Reading, CNC Operator Credential and Essential Skills for Success in the Workplace. By the end of the first semester, students would be employable. At that time they can continue on with CAD Applications for Manufacturing, CNC Operator II and Metrology Foundations during the second semester to further enhance their skills.

By the end of the first semester, students would be employable.

The goal of SUNY Ulster has and will remain to graduate individuals who are able to move seamlessly through the labor market using a variety of credentials. Communicating these credentials to employers is essential. Through programs and funding like these, the career pathway becomes viable and can be integrated into the needs of employers.

SUNY Ulster is changing with the evolving needs of the local technology and manufacturing industries to ensure that students have pathways to local jobs and that manufacturing and technology companies have the workforce they need to remain competitive. The College must continue to remain fluid in its thinking, working in partnership with manufacturers to prepare for today's work world. The tools are there. The College must and will embrace them.



Barbara Ann Livermore Reer is the Director of Professional Technology Programs at SUNY Ulster



MPI 20-06

GREAT CAREERS ENGINEERED HERE

MPI, the leading manufacturer of wax-room equipment worldwide, has been experiencing explosive growth. We're looking for talented people to join our team and help us continue our momentum. MPI is a **GREAT** place to work. Visit the careers section of our website for details or to apply.



(845) 471-7630
mpi-systems.com

APPLY NOW



ROTRON MILITARY & AEROSPACE PRODUCTS

Ametek Rotron is the industry leader in the design, development, manufacture and through life support of high performance, high reliability AC and brushless DC Fans, Blowers and Cooling Systems. With over 25 product active families, we offer the widest available military and aerospace cooling product range in the world, along with a capability to use our field-proven core product baselines to create unique configurations – addressing system specific space, weight noise, power and system interface requirements.



WE'RE HIRING:

Currently seeking qualified candidates to join our team.
Call us at 845-679-1990 or visit us on our website.

55 Hasbrouck Lane Woodstock, NY 12498 | 845-679-2401
www.rotron.com | www.ametektms.com

It Adds Up!
You + Us = Success!

RBT

Find us on **facebook.**

At RBT CPAs, LLP, it is our responsibility to understand your business from the ground up, to gain insight into your changing needs, to forge long-term relationships built on integrity, quality, teamwork, harmony, commitment and innovation, and to deliver solutions that fully prepare you to meet the challenges unique to your business.

Call **845-567-9000** . www.rbtcpas.com
Offices in Newburgh, Wurtsboro & Poughkeepsie

Over 45 Years of Personal Attention & Solutions for Your Professional Financial Needs

Hand Hygiene Where You Need it

Healthy skin and productivity go hand in hand.



PRO-LINK® Skin Care Products

- From mild cleansers to heavy duty scrubs



PURELL ES™ Everywhere System

- Designed to fit your world



Distributed by:
E.A. Morse & Co., Inc.
Middletown, NY 800-800-1730
Castleton, NY 800-800-1730

©2015. GOJO Industries, Inc. All rights reserved.