

## Edgecombe Community College Upgrades Labs to Train Workers for Local Manufacturers



College adopts computer integrated manufacturing and robotics training from Intelitek

### HOW IT STARTED

Edgecombe Community College (ECC) is located in Tarboro, a small town in eastern North Carolina. Like many community colleges, ECC offers customized training programs and has partnered with local businesses and manufacturing companies in its area. The mission of ECC's Division of Business, Industry, and Technologies is to guide and position students for the current, changing, and emerging workforce.

In January 2020, ECC opened the new Center for Innovation on the Tarboro campus. It provides high school and adult students with hands-on access to the newest technology and practices needed for local manufacturing plants. One of the key components to successful workforce development programs is a strong relationship between colleges and local employers, and the Center for Innovation works with an advisory board of local industry managers to ensure they align their programs with industry needs.

"We wanted a solution that offered flexibility to tailor our lab to accurately reflect the needs of our service area, a solution that included industry recognized vendors and third party certifications, and a solution that integrated seamlessly with our school. Intelitek met or exceeded our needs."

*Doug Parish, ECC Department Chair*

# EDGECOMBE COMMUNITY COLLEGE

Integrated manufacturing training prepares students for real industry roles



Students at the Edgecombe Community College use the Computer Integrated Manufacturing lab hands-on program to build real products while learning

“The new Center for Innovation facility on the Tarboro campus will provide advanced manufacturing learning opportunities with the latest cutting-edge technologies and equipment to our area high school and college students.”

*Mary Tom Bass, Director of Public Information*

## THE CHALLENGE

In the mid-1990s, ECC assembled a piece-meal manufacturing lab with milling, a parts loader, and robots. It captured the elements of CNC (computer-numerical control) automation, integration, and process control, and it became a draw for manufacturing companies to move into the area. The college had always taken pride in its computer integrated manufacturing (CIM) setup, but after moving all their technology training into a new building, the school began exploring vendors for updated technology programs.

Working with their advisory board, ECC evaluated industrial training equipment and curriculum that would serve the needs of local manufacturers.

## LEARNING ABOUT CIM MANUFACTURING

Computer Integrated Manufacturing (CIM) curriculum introduces students to automation and industrial applications of CIM manufacturing applications. The curriculum addresses the systems approach to manufacturing and how to manage, maintain, and optimize a production process.

It introduces basic concepts and procedures of CIM production as well as the components and devices in a CIM cell. Using OpenCIMSoftware with a fully simulated industrial CIM, students learn all aspects of a CIM production cycle, from customer order and inventory control, through automated manufacturing of materials into finished parts, to quality inspection and final delivery.

A CIM system has several key components: an automated storage and retrieval system (ASRS), at least one automated workstation, such as a computer-numerical control (CNC) machining, a continuous-loop conveyor, a central management control station, a TCP/IP communication network, and OpenCIM software.

Additional automation workstations can be added, such as laser engraving, hydraulic and pneumatic device operations, process control, and quality control inspection

## INSTALLATION AND TRAINING

After selecting the CIM equipment and curriculum from Intelitek in 2019, Intelitek, their local partner Learning Labs, and ECC confronted the tasks of installation and training as COVID-19 shut down the country. Using appropriate public health protocols, the teams from ECC and Intelitek worked together to install and implement the new CIM and robotics lab and train the instructional team.

"In spite of everything, we managed to deliver the system to the college on time, set up the equipment, and provide instructor training while COVID closed down schools for students," said Amir Prat, Intelitek technology sales representative for North America and Puerto Rico.

ECC use the browser-based Intelitek curriculum that are available online to students 24/7. "The Intelitek curriculum covers 80% of what students need to learn leaving the other 20% to instructors to personalize and customize for local industry needs," said Amir Prat.



MACHINING STATION: Industrial robot arm serving components into a CNC machine

## WHAT IS THE ECC ADVANCED MANUFACTURING TRAINING SYSTEM?

The system that ECC implemented includes:

- A multi-station CIM configuration with a 20' long circular conveyor system for parts delivery
- A CNC Milling Station including a CNC Mill and Motoman GP8 robot arm)
- A CNC Turning Station including a CNC Lathe and Motoman GP8 robotic arm on a linear slide base
- A Laser Engraving Station tended by a Motoman GP8 robotic arm
- An assembly and QC Station with Motoman MHJF robotic arm
- An Automated Storage Robotics System (ASRS) for inventory storage
- The OpenCIM Production Management software application to manage the entire system

Automation components also included:

- A Linear slide base for the robotics arm
- Siemens PLC Automation
- Cognex Machine Vision for quality control
- Operation indicator lights
- Safety components and emergency stop switches
- RFID parts identification
- Pneumatic part holders and shifters (Actuators)

## IMPLEMENTATION

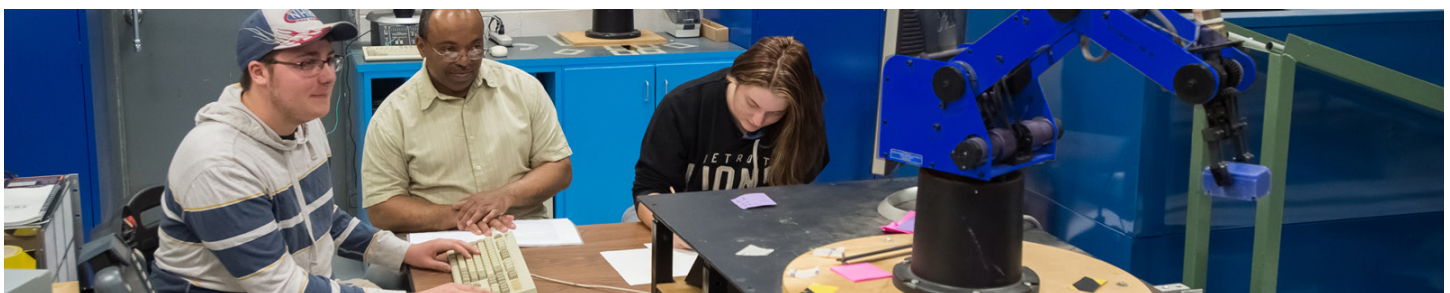
"ECC has completed their second year with the Intelitek system and curriculum and we've been happy with the system," said Doug Parrish, ECC department chair of industrial systems and technical trades. "We're now in the middle of overhauling our program," he said.

"We're tuning even more into local industry needs. We're hearing more about data, metadata, and process control," said Parrish, "and another industry is looking for graduates who can troubleshoot systems, so we think we'll integrate with additional industrial systems."

Some of the local industry segments ECC partners with include:

- Diesel engine manufacturing
- Pharmaceuticals
- Industrial bakery
- Engine control modules
- Electronics manufacturing
- Bundled cable manufacturing

"We have four program areas that serve industry needs, and each has a separate focus," said Parrish. "Between the four programs, there is enough training for students to get into entry level positions at any of our local facilities."



Students in Robotics Lab

## THE ECC ADVANCED MANUFACTURING PROGRAM

ECC has both one- and two-year programs as well as certificate programs. The two year program is 70 hours of college credit that includes everything from plant layout and design to a broader bundle of topics. The one-year program is more focused on electrical systems—both residential and commercial. Facility and industrial maintenance topics provide industry-wide skills. The goal of the programs is to graduate and certify students with a basic set of industry skills that allow them to be productive on day-one for any of the industrial settings. As advanced skill development is usually system-specific, additional training is on-the-job and customized to each manufacturing facility.

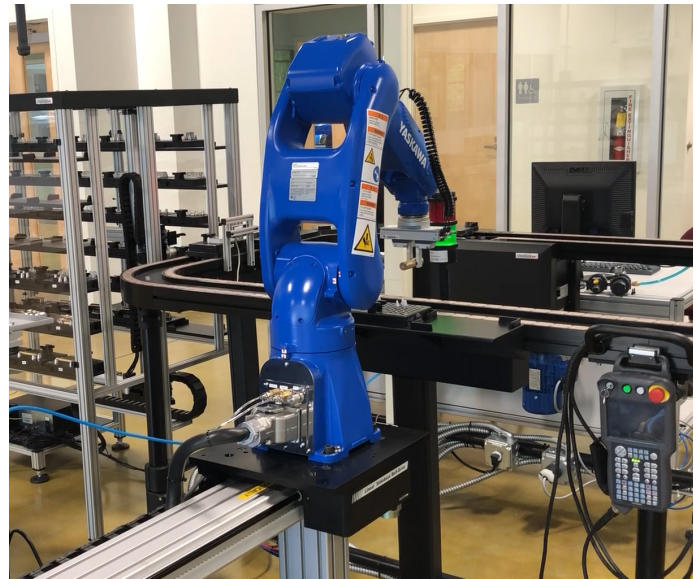
The college has also entered into apprenticeship agreements: one is informal and the other two stay in communication with Parrish. "They hire our graduates regularly," he said.

## EXPANDING THE PIPELINE

ECC is planning to add a second automated line in the same lab; this one will be an Industry 4.0 Internet of Things (IoT) system with higher level data functionality, artificial intelligence, virtual reality systems, and digital twinning. These plans support current industry and ECC hopes that the new capability will attract even more industry.

"We know that industry is looking for workers with a basic industrial skill set," said Parrish. "But they also want workers who can learn on the job and continue to advance as the technology does." Companies also want workers to team up, work collaboratively, and resolve issues and challenges together as a group.

The workforce and economic development that ECC offers its community is significant. In order to expand the pipeline, ECC hosted its first summer camp for middle school students last year and continues to serve high schools with their training programs. With its current leadership, partnership with local manufacturing companies, and vision for the future, ECC is securing its future and serving the local community.



PARTS HANDLING STATION: Yaskawa GP8 Industrial robot arm mounted on a linear slide base transfers components from the circular conveyor. In the back left is the ASRS (Automate Storage Robotic Station).

## INTELITEK PARTNER NETWORK

Our business and technology partners worldwide share our vision of enhancing education for Career and Technology Education and work hand in hand with us to help schools achieve their training goals.

Edgecombe Community College was supported by our partner in the region, Learning Labs Inc.



## ABOUT ECC

Since its founding in 1967, Edgecombe Community College has been committed to fulfilling the education, training, and cultural needs of the Edgecombe County community and surrounding areas. Edgecombe CC has campuses in Tarboro and Rocky Mount and also delivers classes online. The College serves about 8,000 students in two-year degree, diploma, certificate, and continuing education programs.

In January 2020, the new Center for Innovation on the Tarboro campus opened for classes. This facility enables ECC to better train, develop, and sustain a skilled manufacturing workforce. The Center for Innovation is focused on expanding educational and training opportunities available to students and provides high school and adult student populations with hands-on access to the latest technologies and practices found in advanced manufacturing today.

To meet this goal, the College has renewed, strengthened, or created a number of partnerships with regional institutions of higher education. In addition, program directors have developed short-term training courses to equip students with the skills they need to join the workforce.