

Computer-Aided Design AND Engineering Technologies

News about a College Tech Prep Program from the Six District Educational Compact

Hands-on experiences enhance student learning



Displaying their school logos back row from left, Leo Reisinger, Stow-Munroe Falls; Izaiah Tupan, Roosevelt; instructor Jeff Bee; Jessica Stefanco, Roosevelt; Erik Kingsley, Roosevelt. Front row from left, Shawn Lehman, Roosevelt; Bailey Lund-Goldstein, Roosevelt; Derek Radcliff, Stow-Munroe Falls.

Handling a waterjet to fabricate steel

The Six District Educational Compact CADET program is the only Ohio CTE program with its own industrial water jet.

Using the water jet and other equipment, Level II students designed and fabricated all six Compact high school logos, as well as the Compact logo. They cut them out of stainless steel and buffed them with a grinder to create a custom swirl pattern.

All the logos were sealed and then mounted in Roosevelt's Career Technical conference room.

Learning about a micrometer

Learning about decimal equivalencies and accurate measuring tools such as micrometers and calipers is important in the CADET program, as these are industry standard practices. Level I students must be able to read a micrometer to the .001" of accuracy.

According to instructor **Troy Spear**, "Our industry partners have told us that our students should know how to use micrometers and take accurate measurements."



Tristan Grant, Tallmadge, reads a micrometer.

Operating a CNC Router

Early in the first semester, all CADET students learn how to program and operate the CNC router and CNC equipment, while designing and manufacturing parts for a local vendor.

According to instructor **Jeff Bee**, "This fundraiser helps not only in generating income for t-shirts, trips and other fees but also introduces students to setup, operation and utilization of CNC equipment."

The router utilizes a Fanuc control which is the Number One CNC control in the industry, so students become familiar with very common G and M codes or machine programming. In addition, they use industry-duty CAD/CAM software to organize the parts into the material and output the G code.

"I have been looking forward to learning how to operate this piece of equipment since last spring when I visited the program," says Tallmadge student **Jarrod Shumaker**.



Audrey Hepler, Tallmadge, and Gina Kavalec, Roosevelt, measure the tool length.

Using power tools to make a drill gauge

Using power tools, CADET students applied accurate measurements, as well as CAD and layout skills, to make their own drill gauges. As part of the lessons, all students were taught the safety and operation of each tool.

First, they used AutoCAD to produce a blueprint for the product and then imported that drawing into CorelDRAW. Finally, students used the laser engraver to engrave the program's logo, the drill size diameters, and their names onto their material. Incidental hand tools, such as radius gauges, files, and deburring tools, were also introduced.

"I was a little nervous at first, but once I saw and learned the steps I felt a lot more at ease," explains **Gina Kavalec**, Roosevelt.



Marielle Muncy, Stow-Munroe Falls, studies her drill gauge.



Part of National Manufacturing Day, students visit NMG Aerospace



CADET students pose outside NMG headquarters.

As part of National Manufacturing Day in October, CADET students toured NMG Aerospace, a manufacturer of precision parts for aerospace companies, including Boeing and Gulfstream.

Located in Stow, the \$120 million family-owned company offers apprenticeship and internship opportunities for both high school and college students, as well as tuition reimbursement.

CADET students heard about career opportunities from engineering technicians, welding supervisors, human resources professionals, machining supervisors and engineers, as well as the company's CEO and COO.

Students saw how machining cells and high precision machines work in a lights-out situation where they can operate unattended over a weekend. Some of these machines have special tool changers that hold up to 300 different tools.

Welding Demo uses technology to teach

Thanks to a donation from Lincoln Electric, CADET students have learned about the process of welding from an industry-rated welding trainer named "Allie."

This virtual coach demonstrates the proper angle, position and speed of moving the welding gun until students are confident enough to move onto the next level. The next level requires moving the LCD display out of the way, powering up the welding power supply and then welding practice welds in various positions.

During the demo, one student's father demonstrated the welding process and students replicated the technique.

A professional welder adjusts the settings on the power supply while Jeff Bee and Izaiah Tupan, Roosevelt, look on.



CADET students hear about Delta Systems



Allure Johnson, Kent; Tristan Grant, Tallmadge and Greg Schlechter.

Greg Schlechter, Talent Development Manager of Delta Systems in Streetsboro, recently talked with CADET students, as well as students from Electronics, Robotics and Programming.

He demonstrated how to assemble an electromechanical switch and how switches work. Students used the same directions used in the Delta Systems production line.

They also learned more about Delta Systems, its manufacturing focus and how they service the outdoor power tool industry.

Noah Lovas, Roosevelt, says, "I really enjoyed the experience and learning about the processes that Delta employees use."

Roosevelt student **Ri Scherer** and his family attended an evening Open House at Delta Systems, part of a Manufacturing Day experience. Scherer says that both he and his parents were impressed by the cleanliness and employee-friendly environment and the tuition reimbursement program.

Instructors participate in industry training

CADET instructors **Jeff Bee** and **Troy Spear** participated in the Northeast Ohio HTEC conference hosted at Stark State College and sponsored by the Haas Factory Outlet in Twinsburg. They networked with 50 other instructors from

Northeast Ohio and West Virginia, as well as industry representatives and vendors.

During the summer of 2017, Bee and Spear attended a summer workshop thanks to the generous support of the Gene Haas Foundation at Vincennes University in Vincennes, Indiana. They

received training on a CNC machine similar to the one in the CADET lab.

According to Spear, "This was by the far the very best professional development I have ever been a part of in my 21 years of teaching. It was relevant, up-to-date and practical."