Macomb Community College

Students go from Virtual Machining to Cutting Metal at Internet Speed

Online Training System Combines Internet with Hands-on Instruction to Produce Skilled Machinists

Gary Walters, Professor of Advanced Technology Applied Processes

"Students run the virtual CNC panels and 3D machines anytime and anywhere."

- Gary Walters

In just thirty credit-hours—two per week for 15 weeks—Macomb Community College, Warren, Michigan, can teach a complete beginner how to program and operate a CNC machining center—and much more. Macomb's secret is the turnkey Virtual Training Environment for CNC Machining (VTE-CNC), powered by Immersive.biz. VTE-CNC combines learning content management; virtual CNC mill and lathe panel and 3D virtual machines; and interactive graphical learning content.

"Along the journey to a 62 credit hour Associate Degree of Applied Science," says Gary Walters, Professor of Advanced Technology Applied Processes at Macomb, "students can earn CNC Machinist and CAM Technologist certificates. They find it's easier to learn with VTE-CNC—and they keep coming back for more.

Combination Technologies

"Along with CAD/CAM and CNC, we teach how to get the most out of the manufacturing process by utilizing varying levels of automation, such as lasers and probes to define fixture and tool length offsets, magnetic tables, 80,000 RPM spindles, and state of the art cutting tools," Walters continues. He wants graduates to feel confident that they can perform a variety of functions for a Tier 2 or Tier 3 employer. Macomb's flexible class schedules and online capabilities mean that it can provide on demand training to small and medium sized job shops that want to remain globally competitive. These shops use VTE-CNC to introduce new technology to operators or upgrade operator skills in CNC, EDM, rapid prototyping, reverse engineering, and laser. VTE-CNC scalable program makes this happen fast without a big investment.

"It's a *combination* of technologies that allow us to machine at high speeds and feeds, such as 300 to 400 IPM for tool steels and 1,000+ IPM for softer materials such as aluminum," Walters explains. "The machine can't do it alone, nor can the program or the cutting tool." He's excited to provide this level of technology training to beginners and experienced people alike.

Macomb's facility—a Haas Technical Education Center—is one of several around the US. Haas Automation, the world's largest CNC machine tool builder, partnered with the college through the Haas Technical Education Program and the local Haas factory outlet. A key member of this winning team is Immersive.biz.

Learn by Doing

"The best way to learn CNC machine technology is to actually use it!" Says Walters. All registered students get a personal login, which allows them to run the virtual CNC panels and 3D virtual machines—anytime and anywhere. Working at their own pace and repeating material as often as needed, students learn basic tool movements and machine motion; tool response to controller commands; canned-cycle concepts like peck drilling, tapping, circular and linear motion; cutter and tool length compensation; and work offset procedures complete with probing.

Red electric guitar is the final product from an art-to-part process by reverse engineering, CAD/CAM, and high speed machining on Haas machining centers.

Students also learn how to create, run, edit and save programs. They can manually program M&G code, and can load and save NC programs and offsets. VTE-CNC combines virtual, 3D, interactive industrial machines; popular industrial CNC panels; and dynamic CNC mill and lathe curriculum and assessment.

"Plotting out coordinates is the tough part of programming and students must learn it first," Walters explains. "In VTE-CNC, they learn it

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quicker because it's taught through games. Next, they write code, which is the easy part." Steady progress keeps them motivated and they perform better in class.

Gary Walters and Eric Lewicki, Associate degree student, CNC certificates graduate, and MCTEAA- Macomb County outstanding student award recipient.

"We purchased the training system to get more done in less time."

- Gary Walters

That's not all! Students make virtual parts risk-free, then come to class confident and pre-qualified to work on a real machining center under supervision of a teacher. Virtual preparation makes the classroom experience efficient and safe. In 2.5 years of teaching, Walters has seen just one end mill break.

"The virtual training environment is invaluable!" Walters states. "Quite honestly, we purchased the training system to get more done in less time."

Now, students are able to train with VTE-CNC anytime and anywhere. Also, during lectures, I can project VTE-CNC onto a large screen, so everyone clearly sees the control interface and 3D machines. This is much better than trying to gather 20 students around an actual control panel."

The training system has all classroom lecture material built in for access anytime. Walters likes the Learning Content Manager, which he uses to manage his students, set up additional classes, create quizzes, and develop new courses. He recently wrote an EDM course with it and has more in the pipeline. In addition, VTE-CNC provides manuals to accompany the interactive learning content so students have something to hold in their hands.

Walters calls VTE-CNC a great marketing and recruiting tool because it allows him to show off his program visually. "It's always been hard to describe CNC to non-manufacturing students," he says, "but now I can clearly show them CNC technology. I've seen it attract many that never heard of this field. Parents see CNC and it just blows them away."

Walters uses VTE-CNC to link more closely with local high schools and vocational centers where he's expanding the advanced manufacturing program.

VTE-CNC is helping to put manufacturing back into classrooms that have been limited to computer-aided-design for years, due to space restrictions, liability and a shortage of qualified instructors. It's a real win-win.

Return on Investment... BIG TIME!

The Virtual Training Environment for CNC (VTE-CNC) delivers:

- Attract and keep more students.
- Learning is fun, even the tough parts. Students perform better, stay motivated.
- All learning tools available 7/24.
- Students work at own pace and come to class better prepared.
- Students learn machine operation in risk free virtual environment, pre-qualify before using real machine tools under supervision.
- Teachers get more done in less time.

MCC is a customer of Haas Factory Outlet, a Division of Gerotech, Inc. This customer story provided by LearnHaasCNC.com.