FANUC

CNC | ROBOT | iRVISION
FANUC
CERTIFIED EDUCATION

EDUCATION SOLUTIONS CATALOG

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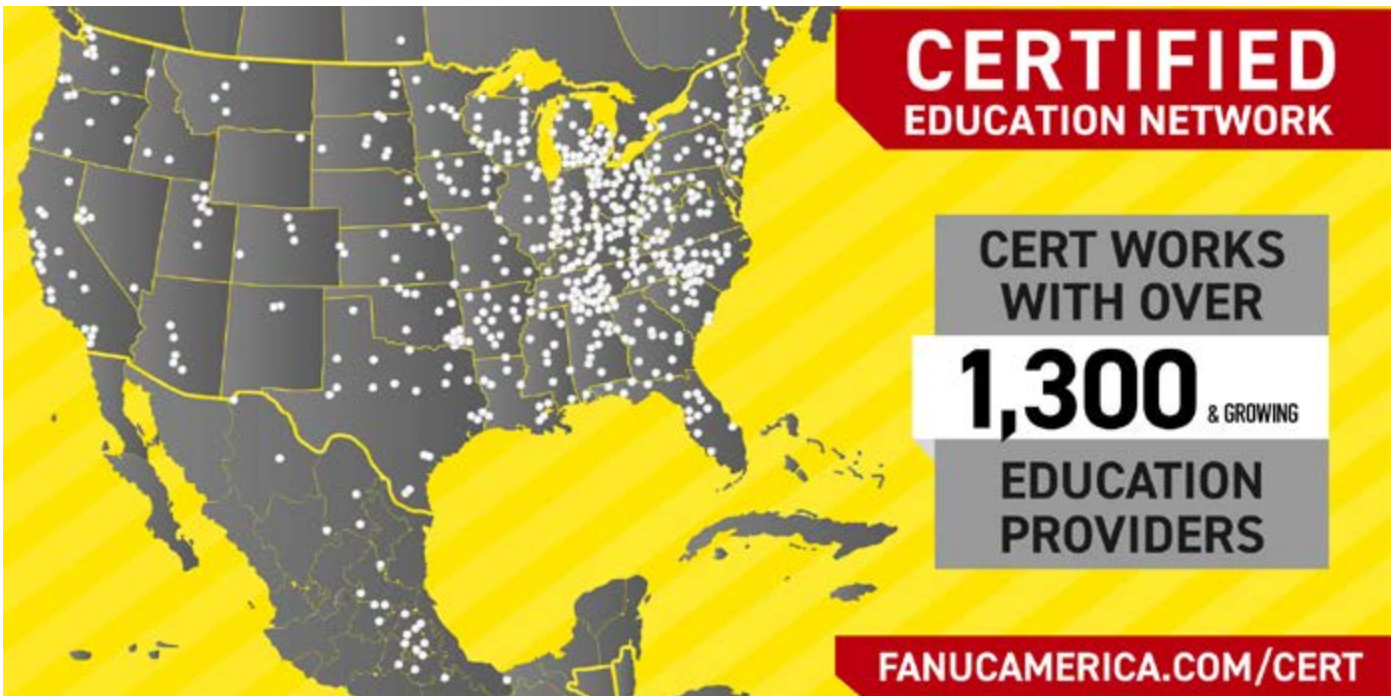
FANUC Certified Education Training

FANUC certified education programs provide industry-relevant training and competency-based skills development across the FANUC CNC and robotics product lines. FANUC collaborates with other industry technology leaders in automation, advanced manufacturing, Authorized System Integrators and academia to develop certification programs that address the needs of employers and align with secondary and post-secondary programs of study. FANUC is an authorized provider of Continuing Education Units. All FANUC educational programs meet the national ANSI/IACET standards. FANUC education programs are directly aligned to meet the nationally recognized certifications provided through NOCTI, MSSC, SACA, NIMS, AMTEC and more...

Our programs provide manufacturers and educators with a STEM-based curriculum centered on CNC and robot programming and operation. With the majority of industry turning to FANUC robots and CNC systems, graduates who are familiar with FANUC equipment and systems have an advantage over their competitors in the job market.

The need for skilled workers with automation training certifications is growing. According to the Manufacturing Institute, there are over 600,000 unfilled manufacturing positions in the US, but many applicants lack the skills and training to do the job. With the number of highly skilled manufacturing jobs continuing to outpace the pool of trained candidates, this gap is expected to grow. The prediction highlights that over two million manufacturing jobs will go unfilled.

With over 25 million products installed worldwide, FANUC is the most common platform in automation. When students enter the workforce, chances are they will be working on a FANUC CNC or robot. Students trained on FANUC products will be better equipped to hit the ground running and be productive from the start.



LEVEL 1: ROBOT SOLUTIONS

WE'RE HIRING

It is predicted that 4.6 million manufacturing jobs will be needed over the next decade.[1]

2X

World trade in manufactured goods has more than doubled. [1]

$2.37T
CONTRIBUTED

In the second quarter of 2019, manufacturers contributed $2.37 trillion to the U.S. economy[1]

1. National Association of Manufacturers, "Top 20 facts about manufacturing"

Students with this level will attain a basic understanding of robot operations and programming, material handling and its components, as well as get introduction to preventative maintenance with troubleshooting. These training solutions and programs are aligned to the FANUC Certified Robot Operator National Certification offered through NOCTI. This level focuses on the core Robot Operator skills needed by employers at an entry level or incumbent workers skills development.

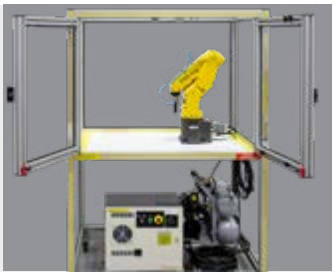
The FANUC FCR-01 & FCR-02 are national assessments based on FANUC's industry recognized Education Program, inclusive of FANUC's Robot Operations, HandlingPRO, HandlingTool Operations and Programming curriculums, ROBOGUIDE simulation software and hands-on FANUC robot labs, provided by a FANUC certified academic instructor.

Specific Standards and Competencies Included in this Certification Assessment:

- Robot Safety and Safety Devices
- Demonstrate knowledge of internal robot safety devices and functions
- Demonstrate knowledge of external safety devices, robot systems and components
- Identify teach pendant features and functions
- Knowledge of robot controller function
- Knowledge of end-of-arm tool (EOAT) functions
- Functions, initial installation and start up
- Prepare robot for installation and startup
- Determine and perform various start up methods
- Perform software setup

LEVEL 1: ROBOT SOLUTIONS

Enclosed LR Mate Cart - Educational training cart incorporates FANUC's latest generation electric, servo-driven mini robot, housed in a self-contained, portable enclosure to provide safety. Take the training where you need it, whether that's on the plant floor, in the classroom, or even at a remote site. Use the education training cart to teach students or employees how to program a real robot, in real time, in a safe, controlled environment.

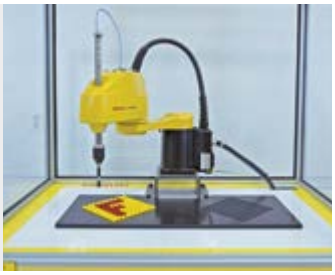


K-12 Introductory Robotics Package - A material handling teach pendant that connects to your computer with ROBOGUIDE software. Install, move and program a virtual robot.

M-1*i*A R30*i*B MATE PLUS 6 axis Tabletop Platform - Six axis M-1*i*A/0.5A robot with R30*i*B Mate PLUS Controller with full safety enclosure and Allen Bradley magnetic safety switch. The robot has a small footprint and offers the same programming ability as FANUC's six-axis articulated robots.

ROBOGUIDE - ROBOGUIDE allows users to create, program and simulate a robotic workcell in 3-D without the physical need and expense of a prototype workcell setup.

SCARA Cart - FANUC's SCARA robots offer best-in-class motion performance. The SR-3*i*A offers a 3kg payload, 400mm reach, and 200mm stroke. A compact, lightweight design provides significant space savings.



Stand-Alone LR Mate, M-1*i*A, SCARA, Collaborative Robot - In addition to robotic cart cells, all of the FANUC robots are available individually for those not requiring a cart.

LEVEL 1: CNC SOLUTIONS

WE'RE STILL HIRING

It is predicted that 2.4 of the 4.6 million manufacturing jobs demanded by 2028 will go unfilled if workers aren't being proactively prepared over the next generation.[2]

Training programs help raise employee morale, increase productivity, and offer more opportunities for a promotion. [2]

2. The Manufacturing Institute, "The Manufacturing Institute Training Survey" published January 17, 2020

Students who achieve this level of training should be competent in their understanding of basic machine types, motion commands, machine coordinate systems, tool and work offsets and basic G and M code programming. Additionally, they will become familiar with the basic operations of the control such as loading and editing data, program verification, machine setup and operation. As a bonus, training on a FANUC control will give students an edge due to its predominance in the industry.

To find out more about these credentials, please contact FANUC America Corporation.
WWW.FANUCAMERICA.COM/EDUCATION

LEVEL 1: CNC SOLUTIONS

CNC Guide Academic Edition - This solution is FANUC CNC software running on a PC. CNC Guide is ideal for development teams and is available with single or multi-seat licenses. CNC Guide provides a realistic operation and part programming environment so students can write, test and optimize programs without taking a machine out of production.

CNC Simulator - Students will experience the look, feel and layout of the control as they navigate and program a fully functioning CNC without the need for a full machine. This simulator is based on the FANUC Series 0*i*-MODEL F platform and can be operated in either milling or turning configurations.

Machine Simulator - With a realistic machining simulation function, users can virtually manufacture parts in milling or turning environments with realistic kinematics and structure. The simulation is based on actual CNC position data, not on the G-code program, providing the most realistic simulation as the virtual machine reacts exactly as a real machine would.

Milling Curriculum: Programming, Setup and Operation - This curriculum is broken down into 10 key concepts and 24 lessons. They are based on knowing the machine from a programmer and operator's standpoint, preparation steps to writing and structuring programs, understanding the motion and compensation types, basic modes of operation.

Turning Curriculum: Programming, Setup and Operation - The turning curriculum is broken down into 10 key concepts and 28 lesson plans following the same format as the milling curriculum. Both curriculums take around 30 hours to complete and have built-in verification testing. They are available online or with textbooks and instructor-led support materials.

ROBODRILL - The ROBODRILL promises unrivaled quality and precision at great hourly rates. At the heart of every ROBODRILL is a patented high-speed tool changer that offers the best reliability in its class. This makes it extremely resistant to radial forces and enables it to deliver unbelievably efficient machining.

4th/5th Axis ROBODRILL - 5 axis machining offers many advantages compared to conventional 3 axis machining, such as decreased fixture and setup time, and the ability to machine more complex part designs. Whether 3+2, 4+1 or full 5 axis simultaneous, the Robodrill is a compact, high speed solution utilizing the FANUC 31*i*B5 Control, featuring the *i*HMI interface.

LEVEL 2: AUTOMATION SOLUTIONS

$26.2B

An estimated $26.2 billion was spent in 2019 on training programs for manufactuing employees. [2]

On average, 189 employees were onboarded at manufacturing firms throughout 2019. [2]

2. The Manufacturing Institute, "The Manufacturing Institute Training Survey" published January 17, 2020

Students with this technical level have a more thorough understanding of robot operations and programming, material handling and its components, as well as integrated technology, such as, 2D *i*RVision, conveyors, digital and Ethernet I/O. These training solutions and programs are aligned to the FANUC Certified Robot Technician National Certification offered through NOCTI. This level focuses on the the primary technical skills needed by employers at an intermediate level or increasing an incumbent worker's skills development.

The FANUC FCR-T1 & FCR-T2 are national assessments based on FANUC's industry recognized Certified Education program. This includes: robot operations; HandlingPRO; HandlingTool operations and programming; 2D iRVision; ROBOGUIDE simulation software; and hands-on robot labs - all provided by a FANUC certified academic instructor.

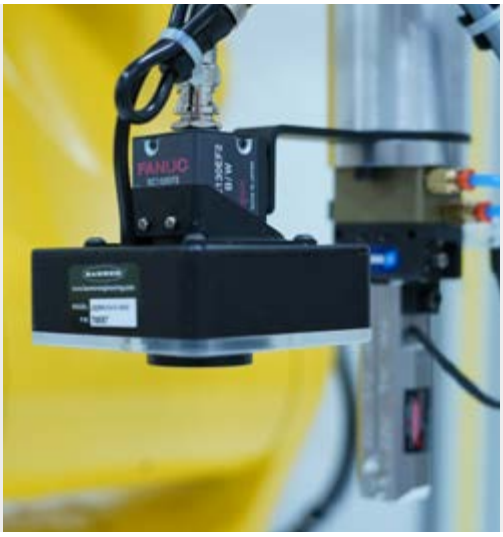
FANUC's Education solutions and equipment use the same advanced machinery a student would encounter upon graduation. Our project-based curriculum will also teach students vital post-graduation skills like problem solving, reasoning, and critical thinking.

To find out more about these credentials, please contact FANUC America Corporation.
WWW.FANUCAMERICA.COM/EDUCATION

LEVEL 2: AUTOMATION SOLUTIONS

ER-4*i*A Fenceless - The FANUC ER-4*i*A fenceless education cart combines FANUC's DCS position and speed check software with a mini safety laser scanner. FANUC's fenceless cart fits through a standard door and runs off 110V power. The fenceless cart provides a larger work envelope and introduces students to FANUC's and Allen-Bradley's integrated safety products.

2D *i*RVision - *i*RVision finds parts and their precise position and orientation (X,Y, Z and R). As a result, production flexibility increases because expensive positioning fixtures are not required. 2D vision is suited for any material handling application including palletizing and depalletizing, as well as vision inspection.



Fenceless Collaborative Robot - The FANUC CR-7*i*A collaborative robot includes a very sensitive built-in sensor allowing it to work safely alongside people.

LEVEL 2: AUTOMATION SOLUTIONS

Machine Tending Educational Cell (MTEC)-SIM - The Machine Tending Education Cell Simulator (MTEC-SIM) is a feature-rich robot and CNC self-contained training cell for multi-level FANUC certifications.

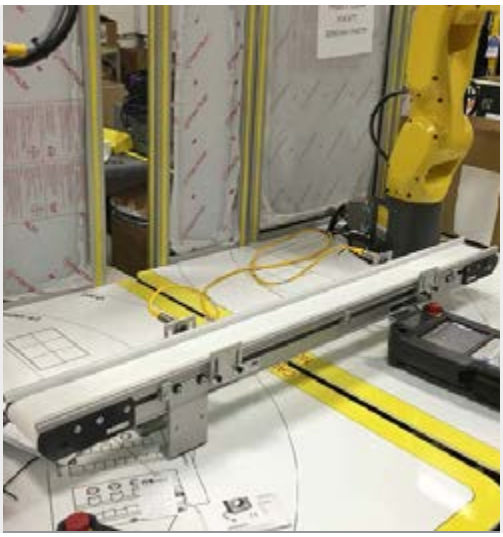
The machines come ready for mill and lathe operation with the robot moving a blank from a pick location to a simulated mill vice or lathe chuck - all in one self-contained cell.

I/O Simulator Box - FANUC America's Industry Certified Education Robot Training program offers an I/O Simulator Box - Designed to give students an application to use digital inputs and outputs. This plug and play unit has eight digital inputs and eight digital outputs.

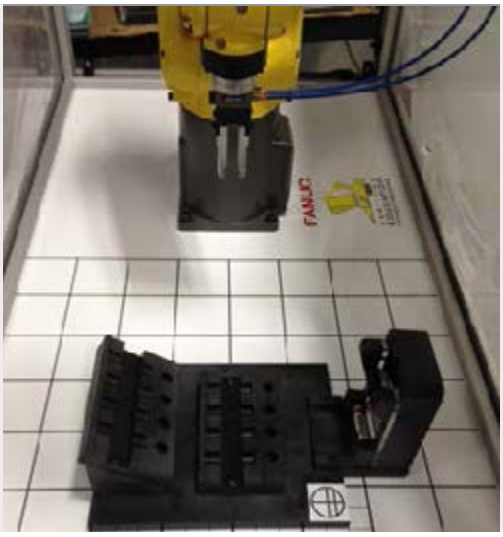
Fenceless Arc Mate - FANUC ARCMATE 50*i*D/7L education cart cell for ArcTool (AT) operations. ArcTorch with embedded laser pointer and welding coupons simulate the welding process.

LEVEL 2: AUTOMATION SOLUTIONS

Conveyor Systems - Single or dual conveyor options. Conveyor options come with proximity sensors and FWD/BWD/Stop controls integrated into the robot via digital or Ethernet I/O for master control.



Project Based Learning Kits - FANUC offers multiple Project Based Learning (PBL) packages designed to give students a practical application to increase their comprehension of FANUC's robot operations and programming and integrated *i*RVision. PBLs reinforce a student's skill and knowledge of problem solving, as well as develop efficient solutions by challenging their ability to focus on methods that help maximize quality and production uptime. PCLs are offered for shapes and motion programming, material handling and palletizing, error proofing with *i*RVision, 2D guidance with *i*RVision and more.



Spot Weld - The spot education cart simulator offers training to operate FANUC robots equipped with SpotTool software and a simulated pedestal-mount servo spot weld gun.

While not an actual spot welder, the tool includes full programming functions for a real servo spot gun without the actual arcing and welding functions. The spot weld gun simulator uses a continuity verification indicator light to show that weld electrodes make contact.

LEVEL 3: AUTOMATED SYSTEMS AND INTEGRATED SOLUTIONS

69.9% of manufacturers state that one of their top roadblocks is finding skilled workers. [3]

One of the most popular ways to combat the skills shortage is collaborating with educational institutions on skills certification programs. 3

3. National Association of Manufacturers, "2019 3rd Quarter Manufacturers' Outlook Survey" published Septembrer 23, 2019

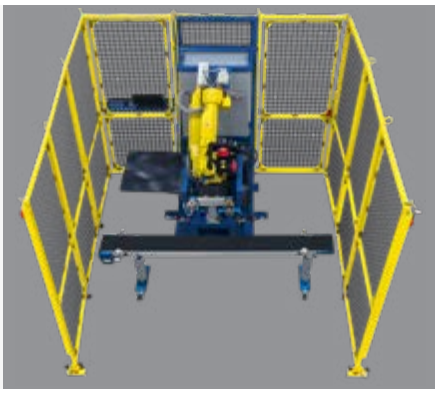
A Level 3 Advanced Technician builds on FANUC's LEVEL 1 and LEVEL 2 programs and progresses to system integration of advanced automation systems. There are various integrated technology options available, including: PLC, HMI, area scanners, light curtains, wireless communication and I/O, pneumatic devices, smart sensors, RFID tags, conveyors, and data analytics. Hands-on training helps students understand the various system technologies, and how they communicate. In addition, students learn how to troubleshoot and recover from common system errors.

Students at this level may earn the FANUC Advanced Technician certification assessment through NOCTI. This level may be co-sponsored by FANUC and the student's employer.

To find out more about these credentials, please contact FANUC America Corporation. WWW.FANUCAMERICA.COM/EDUCATION

LEVEL 3: AUTOMATED SYSTEMS AND INTEGRATED SOLUTIONS

Advanced Manufacturing Education Cell with Integrated PLC - This includes an M-10*i*D or M-20*i*D robot, *i*RVision, conveyor, side tables, and a safety light curtain or area scanner. It can fold up to utilize lab space and can be moved with a pallet jack.

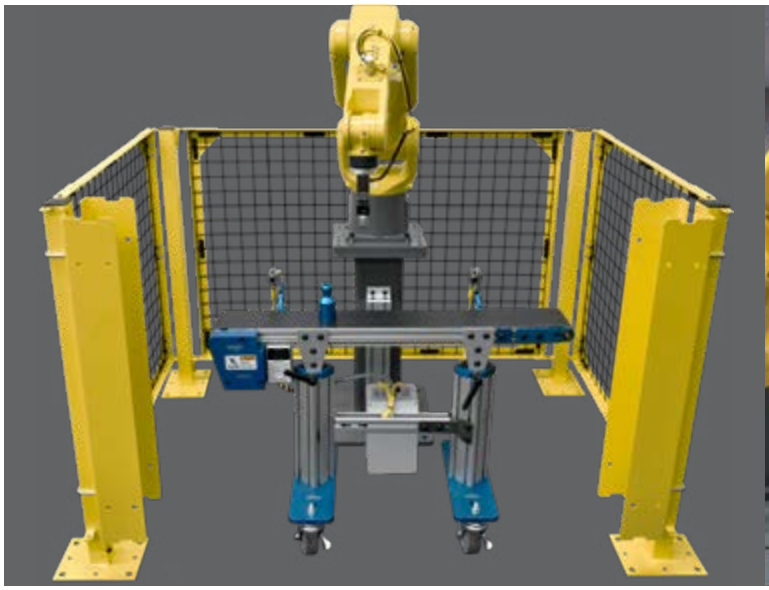


Connected Smart Manufacturing - Demonstrates a variety of functions on a system's HMI that require security clearance including: VFD frequency setup; recipe management system; inspection limits; I/O link setup; login; and system security settings.

Machine Tending Educational Cell - ROBODRILL with 2D *i*RVision - Students familiar with CNCs or robots can learn advanced automation integration on this fenceless cell that includes an area scanner for front or side loading.

Single/Multi-Robot systems with Conveyor and 2D *i*RVision - Demonstrate part presentation to single or multiple robots using conveyance, proximity sensors and smart devices. Students will learn a variety of useful skills commonly found in material handling, logistics and fulfillment applications.

Educational Options and Accessories



Robot Pedestal - Heavy duty, welded structural steel, powder coated pedestals for LR Mate robots. Available in five different heights of 24", 30", 36", 42", and 48".

Pedestals are offered with a mounting plate for several LR Mate 200*i*D models - some models use the same adapter plate.

Conveyor - Tabletop or freestanding versions available. Tabletop version uses magnets for attachment to the CERT cart. Freestanding version is on an adjustable height stand with locking casters. The conveyor uses a seamless, black conveyor belt, driven by a variable speed Brushless DC gear motor with a conveyor mounted speed control. The conveyor incudes sensors at each end. Sensors can be used with the robot's digital inputs. The robot's digital outputs are used to move the conveyor forward or in reverse.

Robotic Safety Kits and Fencing Options - Lab environment safety kits are available in small (5'x5'), medium (7'x7') and large (10'x10') - detailed instructions are provided. Optional latched gates, light curtains and area scan kits are available including power supplies and safety devices and can be integrated to the robot's safety circuit.

Kits use industrial type mesh fencing with yellow frames and black mesh. Panels are 53" tall off the floor for good physical and visual barrier to work envelope. All safety kits (basic assembly required) have yellow frames and black mesh. Panels are 53" high — customized configurations available upon request.

Testimonials

"Manufacturing is becoming more and more automated every day. Everything is being done by machines, creating a need for a higher educated workforce. The students that are coming here and learning about robotics are getting those higher paying jobs."

— Bob DuCharme
Instructor
Oakland Schools Technical Campus

Clarkston, MI

"Our two-year robotics training program is based on STEM initiatives that have prepared students to go directly to work in high-paying careers. In fact, since we began the program in the 1980s, we've achieved nearly 100% placement for our graduates, all accepting starting positions with average salaries exceeding $60K."

— John Sefcovic
Oakland Community College Faculty
Robotics & Automation Program

Auburn Hills, MI

"FANUC has the most common control platform, which is the one that students will see when they enter the job market."

— Adam Handler
Engineering Teacher
Nova High School

Davie, FL

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