Contact

X-Cal Corp. is one of three companies founded by Tim and Dede Brown in order to meet the growing need for technical and vocational training. X-Cal operates in New Mexico, Colorado, Utah, Idaho, Montana and Wyoming.

Through our network of manufacturing partners, we provide the most up-to-date curriculum resources, software, equipment, furniture, professional development and customer support available today, for a wide range of STEM and Career and Technical Education areas.

X-Cal exists to equip schools, colleges, universities and companies with technology enabled training solutions that empower learners to create a better life for themselves and their families while enabling American companies to increase their competitiveness in the global economy by providing solutions to train a highly-skilled workforce.

Solutions Center

Our Solutions Center is a 14,000 square foot commercial building that is divided into abundant space for our offices, demonstration areas, and training rooms, as well as a 6,000 square foot warehouse.

The new building provides many structural upgrades which allow us to showcase the latest equipment available in our hands-on demonstration areas. Additionally, we added state-of-the-art training rooms and conference center.

Not only does the warehouse provide a demonstration area for our larger pieces of equipment, it allows us to keep an inventory of popular products, and spare parts to shorten the delivery cycle and minimize equipment downtime.

We would like to invite you to our new facility to give you a firsthand tour of our comprehensive solutions for CTE, Engineering, Robotics, Additive Manufacturing, Certifications, Industry 4.0, STEM, Medical Simulators and much more!

Contact your regional manager to find out more about the equipment available in the Solution Center or sign-up to get notifications on our upcoming events.
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Limited Training Space? Check out Amatrol’s portable learning systems!
Smart Automation Certifications | Industry 4.0

SACA’s Smart Automation Certifications use a modular structure to enable them to fit a wide range of individual needs, industries, and educational environments.

SACA offers certifications in three categories: Associate, Specialist, & Professional. Each certification is stackable allowing individuals to start with one certification and add other certifications to customize their documented skills. Certifications are occupationally focused so they prepare individuals for specific occupations in the world of Industry 4.0.

**Associate**
The Associate certifications certify that individuals are prepared to succeed as production technicians in an Industry 4.0 manufacturing environment. These certifications are also ideal for IT professionals seeking to become prepared to apply their IT skills in a modern plant floor environment and incumbent industrial maintenance technicians seeking to acquire Industry 4.0 skills.

**Specialist**
The Specialist certifications certify Industry 4.0 technical skills in troubleshooting, programming, maintaining, and integrating systems. The specialist certifications are modular certifications consisting of a series of micro credentials, each with its own examination. Once an individual has obtained enough micro credentials, a Specialist certification is granted by SACA.

**Professional**
The Professional certification is an engineering level certification that focuses on design and optimization of Industry 4.0 systems. It is designed in a modular format, similar to the Specialist certifications, but with a larger number of elective credentials and fewer core credentials to enable the certification to be further adapted to specific needs.

*Industry-Driven Industrial Certifications*

SACA certifications are industry-driven, developed for industry by industry. They are developed through a rigorous process that begins with the creation of truly international skill standards, endorsed by leading experts in Industry 4.0 technologies throughout the world. Certification examinations are created based on these standards, pilot tested, and statistically analyzed to ensure quality. Each certification includes a proctored hands-on evaluation and an online test to ensure that candidates for certification can “do” as well as “know.” SACA uses an annual review process for all certifications to ensure that standards and examinations remain current and relevant in the fast-changing world of Industry 4.0.
Manufacturing Skills Standards Council

Overcoming the Skills Gap through Industrial Certifications
The nationwide MSSC certifications, based upon industry-defined and federally-endorsed national standards, offer both entry-level and incumbent workers the opportunity to demonstrate that they have acquired the knowledge and skills needed in technology-intensive advanced manufacturing and logistics jobs.

MSSC has developed nationally portable certifications:

**Certified Production Technician (CPT):** Addresses the core technical competencies of higher skilled production workers in all sectors of manufacturing. MSSC awards certificates to individuals who pass any of its five Production Modules: Safety, Quality Practices & Measurement, Manufacturing Processes & Production, Maintenance Awareness and Green Production and a full CPT Certification to those who pass all four core modules (Note: Green is not required for full-CPT certification.)

**Certified Logistics Technician (CLT):** Addresses the core technical competencies of higher skilled, frontline material handling workers in all supply chain facilities: in factories, warehouses, distribution centers and transportation companies. MSSC awards the foundational-level Certified Logistics Associate (CLA) certificate and the mid-level CLT certification. CLA is a prerequisite for CLT.

CPT and CLT are the only national industry certifications for manufacturing and logistics, accredited under ISO 17024 (personnel certification) and endorsed by the National Association of Manufacturers.

**Certified Technician Supply Chain Automation (CT-SCA):** The purpose of this program is to prepare technicians who install, operate, support, upgrade, and maintain the automated material handling equipment and systems which support the supply chain.

**Certified Forklift Technician (CFT):** MSSC and MHEDA have partnered to develop the CFT program which provides basic skills needed to maintain and repair systems for most forklift vehicles. CFT includes 55+ hours of instructor-led computer-based training.

MSSC benefits to employers include:

- A pipeline of skilled workers by embedding MSSC certification training into schools
- Decreased recruitment costs by providing job candidates with industry-recognized credentials
- Elimination of remedial training costs by providing well prepared workers
- A new ISO standard in certificates companies can use as a common practice throughout their global operations
- Increased ROI for training by targeting it against the gaps identified by the MSSC Diagnostic Tool
- An aid to attracting, motivating and retaining qualified employees

Go to x-cal.us/mssc for more information!
Certified Production Technician Program

The Certified Production Technician (CPT) program enables students to build foundational skills, work effectively with others, identify and solve problems, and continue to acquire the necessary skills for successful careers.

The program's interactive multimedia curriculum uses a competency-based instructional design that teaches MSSC’s nationally-recognized standards.

Amatrol’s turn-key program includes:

- Four Certification Areas
  - Safety
  - Quality Practices & Measurement
  - Manufacturing Processes & Production
  - Maintenance Awareness
- 224 Industry/Career Skills
- 140+ Hours of Learning
- 39 Self-Paced Learning Units
- 25 Seats per Production Module

Skill Boss Logistics

Amatrol's Skill Boss Logistics offers material handling organizations performance-based assessment for evaluating the skill levels and competencies of future supply chain automation technicians.

This system is a working automated distribution system that performs real-world operations, such as package tracking, automatic package queuing and priority release, electro-pneumatic sorting, and much more!

In addition to industrial-relevant training, the Skill Boss Logistics is the required assessment device for three of MSSC's Certified Technician – Supply Chain Automation (CT-SCA) certifications:

- Equipment Maintenance (CTSCA-EM)
- Equipment Repair (CTSCA-ER)
- Network Repair (CTSCA-NR)

Individuals who earn all three certifications receive a full "Automation Master" recognition award.

The federal National Skill Standards Board formally recognized MSSC as the standards and certification "Voluntary Partnership" for all manufacturing sectors in 1998 and officially endorsed MSSC's national standards in 2001. MSSC has since been used by the U.S. Departments of Labor, Education, Defense and Veterans Affairs, as well as Job Corps and both Federal and State Prison Systems. MSSC is a Founding Partner in the National Association of Manufacturers (NAM)-endorsed Skills Certification System, which has endorsed both CPT and CLT.
National Certifications for Robotics and Advanced Automation Manufacturing

**FANUC Certified Robot Operator Certifications**

Students with this level have a basic understanding of robot operations and programming, material handling and its components, and introduction to Roboguide simulation software. These certification programs are focused on the core Robot Operator skills needed by entry level or incumbent workers.

**FCR-O1 FANUC Certified Robot Operator-1**
Written assessment for an entry level position as a robotics associate in manufacturing. The assessment exams allow the candidate to demonstrate their knowledge in: Robot operations, frame setup, writing, modifying and executing basic motion programs, program offsets, backups and restorations, creating and modifying simulations.

**FCR-O2 FANUC Certified Robot Operator-2**
Performance assessment for an entry level position as a robotics associate in manufacturing. The performance exams allow the candidate to demonstrate their hands-on skills in: Robot operations, frame setup, writing, modifying and executing basic motion programs, program offsets, backups and restorations, creating and modifying simulations.

**FANUC Certified Robot Technician Certifications**

Students with this level have a more advanced understanding of robot operations and programming, material handling techniques, technical system components, and 2D integrated robot vision guidance and part inspection process, as well as Roboguide simulation software skills required for Robotic Technicians to enter automation manufacturing, production operations, and robotic systems engineering.

**FCR-T1 FANUC Certified Robot Technician-1**
Written assessment for technical level position as a robotics engineering associate in manufacturing. The assessment exams allow the candidate to demonstrate their knowledge in: Single axis mastering on all six axis, how to create and execute a pick and place program for load and unload applications, and how to set up and program 2D Integrated Vision for part offset and inspection.

**FCR-T2 FANUC Certified Robot Technician-2**
Performance assessment for technical level position as a robotics engineering associate in manufacturing. The assessment exams allow the candidate to demonstrate their skills in: Single axis mastering on all six axis, how to create and execute a pick and place program for load and unload applications, and how to set up and program 2D Integrated Vision for part offset and inspection.

**Welding / AWS SENSE Program**

SENSE is a comprehensive set of minimum Standards and Guidelines for Welding Education programs. Schools can incorporate SENSE into their curriculum to help attain Perkins funding and help ensure an education that is consistent with other SENSE schools across the nation. The American Welding Society fully supports this program.
CERT Education

**FANUC CERT Program Robot Cells Made for Classrooms**

Industrial robotics training in the classroom can safely be achieved through the CERT program. FANUC America provides the necessary training to the instructor as well as a curriculum to introduce students to robot applications including: integrated vision systems (iRVision), programming a logic controller, and using ROBOGUIDE simulation software. To accompany the CERT program, an eligible school can purchase a new innovative educational tooling package. With this package, students will utilize the same robots and software that are used in industry. Schools can use the new package to integrate robot training into their programs and initiatives.

**CNC Training Solutions**

FANUC America is partnering with educational/academic institutions across the country to develop programs, curriculum, software and teaching tools that provide students with the knowledge and skills that employers need. The goal of this program is to make students more marketable and valuable in the workplace by having the knowledge and skills needed to set up and run the most advanced CNC systems.

**Desktop CNC Simulator**

Affordable and portable training solution on ‘real’ FANUC hardware.

**ROBODRILL and Education**

FANUC ROBODRILL Machines are high-speed, highly precise and highly reliable. The high-speed cutting makes it very easy to quickly machine precision parts with high accuracy. The high reliability and long life of ROBODRILL machines are guaranteed due to its robust and uncomplicated construction. Because of its versatility, the FANUC ROBODRILL can be used in many different fields. The machine has been successfully used for high volume production in a wide range of sectors, including:

- automotive
- electronics
- medical tools
- implants
- watches and jewelry
- mold and tool making

We’ll help you find the best FANUC CERT product to help fit your needs.
NIMS, Lightweight Innovations for Tomorrow (LIFT) and Ivy Tech Community College are partnered to enhance and expand training to fill the largest number of open manufacturing jobs. The program is part of a comprehensive effort to prepare a new industrial technology maintenance workforce, which drives the performance and improvement of high-tech manufacturing, and has grown in demand by 118% from 2011 to 2015.

NIMS ITM Certifications are available in the following duty areas:

- Duty Area 1: Maintenance Operations
- Duty Area 2: Basic Mechanical
- Duty Area 3: Basic Hydraulic
- Duty Area 4: Basic Pneumatic
- Duty Area 5: Electrical
- Duty Area 6: Electronic Control
- Duty Area 7: Process Control
- Duty Area 8: Maintenance Welding
- Duty Area 9: Maintenance Piping

These stackable credentials enable students to learn and earn at the same time!

NIMS (National Institute for Metalworking Skills) endorses Amatrol’s Industrial Maintenance Certification Program. NIMS provides national standards for metalworking. Additional details on how to obtain a certification can be found at Amatrol.com or NIMS-Skills.org.

Amatrol’s NIMS CNC Machine Operator Program

CNC Machine Operator skills are required for over 500,000 manufacturing jobs. A CNC machine operator requires expertise in running CNC machines but is not a machinist. Unlike most CNC training programs available today, Amatrol’s CNC Machine Operator Program has been designed in partnership with a large global manufacturer specifically for machine operators, streamlining and focusing on the skills these operators need.

Industry-Validated Turn-Key Program Includes:

- 24 self-paced learning units
- 132 skills, 80+ hours of learning
- Instructor’s guide with authentic skill assessments (practice for NIMS certification)
- OJT (On-The-Job-Training) guide
- NIMS exam registrations(s): Flexible Delivery - via the web or server-based in the classroom
- Skill tracking and reporting software available
- Both FANUC and Haas Controls

NIMS endorses Amatrol’s CNC Machine Operator Program exclusively as the recommended preparation method for the NIMS CNC Machine Operator Certification. NIMS provides national standards for metalworking. Additional details on how to obtain a certification can be found at Amatrol.com or NIMS-Skills.org.
Industrial Certifications & Endorsements

IT Certifications
Microsoft Networking Fundamentals
MTA Exam 98-366
Introduction to Networking

Microsoft Security Fundamentals
MTA Exam 98-367
Introduction to Security
Cyber Security Essentials

CompTIA A+ Certification
Maintaining and Repairing PC’s

CompTIA Network+ Certification
Network+ Certification

ISACA Security Fundamentals Certificate
Cyber Security Essentials

CompTIA Healthcare IT Technician
Cyber Security Advanced Healthcare IT

CompTIA Security+
Cyber Security Essentials

Certified Ethical Hacker
Hacking, Cracking and Internet Jacking
(Advanced hacking)

CompTIA Advanced Security Practitioner (CASP)
Advanced Enterprise Security

Smart Home Technologies
Residential Electronics Systems Integrator (RESI)
Install and interconnect residential electronic communications, computer, control and entertainment equipment. Our expert training systems are the perfect addition to your construction or electronics program.

Smart Home Certifications
Electronic Technicians Association (ETA)
ETA Residential Electronics Systems Integrator
Basic Residential Electronics Systems Integrator

ETA Audio-Video Endorsement
RESI Audio-Video Endorsement

ETA Security-Surveillance Endorsement
RESI Security-Surveillance Endorsement

ETA Data Cabling Installer
Low Voltage Wiring Certification Program
MECP Basic Installer Certification Program

ETA Certified Alarm Security Technician
Security-Surveillance Certification Program

ETA Fiber Optic Installer
Fiber Optic Installer Certification Program

Consumer Electronics Association: Mobile Electronics Certified Professional Certification

Renewable Energy/Energy Efficiency Certifications
NABCEP PV Installer, Entry Level
Solar/PV Installer

ETA Solar/PV Installer
Solar/PV Installer Training Guide

ETA Small Wind Installer
Wind Turbine Technician Training Guide

RESNET Rater/Auditor
Energy Auditing
Industrial Skills Trainers: Advanced Manufacturing

**Electrical**
- AC/DC Electrical
- Motor Controls & VFD’s
- Power Distribution & Wiring

**Mechanical**
- Mechanical Drives
- Vibration Analysis
- Laser Alignment

**Fluid Power**
- Basic Hydraulics & Pneumatics
- Advanced Fluid Power and Troubleshooting
  Double-Sided Bench (left)

**Electronics**
- AC/DC Drives
- Power & Control Systems
- Motion Control
- Programmable Logic Controllers (PLC)

**Automation**
- Robotics
- PLC’s
- Mechatronics

**Smart Factory**
- Automation
- Electrical
- Electronics
- Fluid Power
- Process Control
- Machining
  See page 14.

**Process Control**
Many of Amatrol’s learning systems use FaultPro, the industry’s only electronic troubleshooting system, to offer hands-on troubleshooting skills like in-circuit component testing methods and universal digital controller troubleshooting training.
Industrial Skills Trainers

Industrial Maintenance & Mechatronics

*Amatrol delivers total learning solutions for advanced manufacturing!*  
Amatrol provides total learning solutions for the ever growing critical problem of skill shortages in manufacturing. You will find that their many learning systems cover the full range of needed skills – from basics to advances across pretty much every technology used in industry today. Their focus is job ready and they provide the tools you need to make that happen.

**Key Features:**

- Highly demanded industry skills: hands-on, job-ready
- Individualized self-paced or group learning
- Extensive curriculum ranging from basic through advanced
- Authentic industrial troubleshooting
- Durable, industrial equipment
- Superior multimedia interactivity
- eAssessment to accelerate learning and improve effectiveness
- Learning anywhere, anytime – 24 x 7
- Computer-based training with Amatrol’s eAssessment

**Industry Skill Areas:**

- Foundation Skills
- Problem Solving & Analysis
- Troubleshooting
- Operation
- Turning & Adjustment
- Installation
- Maintenance & Repair
- Application

**Multimedia**

Interactive multimedia with vivid 3D graphics designed to teach and engage, check for understanding, and provide feedback. Frequently includes virtual skills that allow students to perform the same activities in the simulation they would with hands-on equipment.

**Smart Factory Mechatronics Training System**

*An eight-station automated manufacturing line that assembles a functional, two-way pneumatic valve.*

This system utilizes either a FANUC LR Mate robot or an Amatrol Pegasus robot, iGear Squeaks software for Smart Factory communication, Allen-Bradley and/or Siemens PLCs, and a ninth cart that houses systems for Ethernet (87-EN), Wireless Communication (87-WL), and Network Security (87-NS) training.

Each of the main stations features a smart sensor or component for Smart Communication, including pneumatic/vacuum, ultrasonic, photoeye, stack light, electrical current, and analog pressure.
**Industrial Skills Trainers:** *Portable Trainers*

**Portable Learning Systems:**
Train in a classroom, shop floor, or almost anywhere. Portable trainers fit in cars for easy transportation. Avoid the logistical hassles of trailer-based systems. Quickly change over a classroom for different courses. Portable systems store in a closet and set up in minutes!

**Comprehensive Training**
*No Sacrifice for Portability*
- Same knowledge and hands-on skill training as larger systems
- Industrial components ensure relevant skill transfer
- Ability to connect with other learning systems

**Portable Systems with Electronic Fault Insertion:**
- Pneumatic Troubleshooting
- PLC - Allen Bradley
- PLC - Siemens
- Relay Control
- Motor Control
- AC Motor
- Drives

**FaultPro Troubleshooting Training**
Amatrol’s FaultPro computer-based fault insertion software automatically inserts faults allowing students to learn troubleshooting in a self-directed environment. Teacher intervention is not required allowing them to support more students. Available on many models.

**Portable Hydraulics Training**
*Skill-Building for Basic Hydraulics Applications*
- Topics include basic hydraulic circuits, pressure control circuits, hydraulic schematics, and sequence valves.
- Includes gauges, manifolds, cylinders, valves, flow meter, and hydraulic motor.
- Includes schematic symbols for each component, creating the ability to read and draw their own hydraulic schematics.

Go to x-cal.us/portable for more information!
Amatrol’s “Smart Factory” is a fully connected and flexible manufacturing system that connects its physical systems, operational information, and human assets to control manufacturing, maintenance, inventory, and supply chain operations. Amatrol’s in-depth curriculum teaches all aspects of smart factory maintenance and operation in a self-directed, interactive format.

**Smart Product ID**
The Smart Factory incorporates smart product identification devices, such as vision systems and bar code readers, which trigger “intelligent” actions, including parts tracking, production history, sorting, part accept/reject, and inventory control.

**Smart Sensors**
Amatrol utilizes multiple smart devices on the Smart Factory that communicate via Ethernet and I/O Link protocol providing flexible manufacturing, predictive maintenance, and data analytics capabilities.

**Network Communications**
Amatrol’s communication system connects students with a fully functional production system using industrial protocols for real-time control, program transfer, data collection, and changing programs on the fly.

**Network Security**
Amatrol’s network security system teaches how to keep data safe and securely extend operational data to suppliers and customers.

**Smart Production**
Amatrol’s Smart Production software teaches how smart factories perform customized (personalized) manufacturing and make data and data analytics available via the Internet to improve system performance. Amatrol’s Smart Factory assembles a pneumatic valve in various configurations on orders entered. The valve can be ordered with a plastic or metal valve body and either a 3-way or 4-way spool.

**Smart Maintenance**
Smart Maintenance software utilizes smart device information to automatically trigger maintenance operations. Amatrol’s Smart Factory uses industry standard software to connect users directly to the automated system and each other to create a real-world environment where maintenance team members can collaborate to resolve issues quickly and effectively.
Industrial Process Control Education

Amatrol has developed the largest and most in-depth offering of industrial process control training options available. Amatrol offers four major process control systems, each covering a different process control application: level and flow, temperature, analytical, and pressure. Amatrol also offers a variety of training options for related process control applications such as HART communication protocol, Foundation Fieldbus, and SCADA. This in-depth offering of process control training solutions fit within various Amatrol programs.

Level / Flow Process Control and Level / Flow Process Control Troubleshooting

Level / Flow Process Control Learning System (T5552): teaches two of the most common types of process control systems, flow and liquid level, and the basic concepts.

Expansions

- Smart Flow Transmitter Learning System (T5552-F1)
- Ultrasonic Liquid Level Learning System (T5552-L1)
- Foundation Fieldbus Process Control 1 Learning System (T5552-FF1)
- HART Process Control 1 Learning System (T5552-H1)
- Visualization Process Control 1 Learning System (T5552-S1)

Temperature Process Control Learning System (T5553): allows learners to study and practice calibrating, adjusting, installing, operating, and tuning thermal process control systems in industrial applications.

Analytical Process Control Learning System (T5554): covers major topics and skills involved with controlling and modifying the chemical properties of a substance.

Pressure Process Control Learning System (T5555): offers the ability to control liquid level and tank pressure simultaneously using a human machine interface (HMI), programmable automation controller (PAC), and variable frequency drive (VFD).

Connect All Four Systems to Create an Entire Process Plant!

4-Variable Advanced Process Control Training System

Hands-on exercises include industry-relevant process control skills, such as: setting and adjusting pressure switches; installation and calibration of an electronic flow measurement channel; and determining a temperature, pressure, level, and flow process’ operation characteristics.

Process Control & Instrumentation Products

- Training Systems
- Models
- Cutaways
- Dissectibles
Renewable Energy Learning Systems

**Alternative Energy**
The Amatrol Alternative Energy Learning System – Wind and Solar includes a mobile workstation with solar PV components, small wind components, multimedia student curriculum, and teacher’s assessment guide. The mobile workstation is equipped with pre-mounted components for easy inventory. Wind turbine and solar panels also allow for outside use with expansion capability for teaching grid-tie and data acquisition. Amatrol also offers alternate workstation configurations for either small wind or solar individually.

**Solar PV**
Allows students to develop the specialized skills and knowledge needed for installing and troubleshooting common types of PV systems.

**Solar Thermal**
Teaches students the installation and commissioning of closed loop and open loop solar thermal systems for commercial and residential applications.

**Multimedia Courses**

**Solar Concepts Learning System (950-SC1)**
Introduces learners to a broad range of basic concepts in solar energy and technology. Photovoltaic and thermal solar systems are introduced to students. They learn how to translate location, sun, and technology into practical applications. The Solar Concepts training acts as a foundation for students in solar technology.

**Wind Concepts Learning System (950-WC1)**
Introduces learners to a broad range of basic concepts in wind energy technology. Learners study how wind power systems work and what it takes to generate electrical power with wind. Wind Concepts training acts as a foundation for learners enrolled in wind-specific as well as general renewable energy programs.

**Training Products**
- Alternative Energy Training
- Open-Loop Solar Thermal Troubleshooting Training
- Solar Concepts Training
- Solar Thermal Troubleshooting Closed-Loop Training
- Turbine Electric Hub Troubleshooting Training
- Wind Concepts Training
- Wind Turbine Generator Control System
- Wind Turbine Nacelle Training
- Alternative Energy Learning System Solar Certifications Training
- Geothermal Troubleshooting eLearning Course | Renewable Energy Training
- Solar Grid-Tie eLearning
- Solar PV Installation Training NABCEP Certification
- Solar Site Analysis Training
- Solar Thermal Cold Water Supply Station Training
- Solar Thermal Installation Training NABCEP Certification
- Solar Thermal Sun Simulator Training
- Troubleshooting Solar PV Systems
- Wind Turbine Generator Control eLearning
Industrial Skills Trainers: eLearning

Amatrol eLearning

*Interactive Technical Skill Development, Hands-On Virtual Simulators!*

Amatrol’s eLearning program offers flexible technical training by providing excellent technical content depth and breadth, interactivity for skill development, and excellent assessment and student tracking through an intuitive, easy-to-use web portal.

The material is self-paced, making it ideal for individual use, traditional class settings, or a blended approach. Amatrol’s proven curriculum is problem-solving-oriented and teaches technical skills in a wide range of industrially relevant technologies.

Amatrol Virtual Trainers

Amatrol’s virtual trainers allow learners to practice hands-on skills via eLearning. These simulations replicate physical training systems in such great detail that learners can build essential skills even when they don’t have access to equipment.

These virtual training systems do not force learners through a predetermined series of steps. The trainers allow students to make connections or take steps they choose, enabling them to learn from their successes and errors. The virtual trainers can significantly reduce students’ hands-on time with equipment to complete skill mastery.

Amatrol eAssessment

*Identify Skill Gaps for More Efficient Training*

Amatrol’s eAssessment offers the power to train each employee based on their skill gaps! This assessment prevents training overlap improving training effectiveness and technical training efficiency while reducing training cost and time.

**Training Topics Include:**

- Electrical
- Electronics
- Fluid Power
- Machining
- Manufacturing Processes
- Mechanical Systems
- Plastics
- PLCs
- Quality
- Robotics
- And more!
Bayport Technical specializes in building cutaways, trainers, working industrial demonstrators, training models, and customized training equipment primarily in the areas of instrumentation and process control.

Training Systems
Give students hands-on experience working on equipment they will encounter in their careers.

Working Demonstrators
Offer realistic, first-hand visualization into the inner workings of industrial components and structures.

Training Models
Detailed, to-scale models that depict various industrial machines and include primary features and components.

Cutaways
Allow learners to see & understand the internal operation of actual industrial components.

DAC Worldwide has been helping maintenance departments, training professionals, vocational educators, and workforce development specialists with realistic, hands-on training systems for over 35 years.

Industrial Cutaways
These cutaways are restored real-world industrial components sectioned to expose each device’s primary features and refinished.

Dissectibles
Offer learners realistic, first-hand visualization into the disassembly, inspection, and reassembly of various industrial components.

Models
Detailed, to-scale models that depict various industrial machines and include all primary features and components.

Sample Boards
Each board features a selection of industrial-quality mounted and labeled components for easy association with individual components.

Training Systems
These systems are built with full-size, industrial-quality components, as well as high-durability, powder-coated surfaces throughout.

Furniture
DAC Worldwide’s selection of furniture offers a variety of solutions for creating flexible and functional training areas.
High School Project/Work-Based Learning
Skill-based learning programs that attract & retain learners

Amatrol’s high school programs are designed to engage students who demand a high degree of interactivity to keep them interested and learning. All our high school programs allow students to learn at their own pace, and articulate to colleges for up to 18 credit hours.

Amatrol’s Pre-Engineering and Manufacturing programs are a great way to get high school students interested in exciting and rewarding careers. Hands-on experience in a wide range of engineering technologies using industrial quality equipment and software prepares them for success in college and beyond.

Amatrol’s High School programs use a unique blend of project-based team learning combined with a rotational individualized learning format for technical skills development. Amatrol offers both traditional equipment based labs as well as virtual labs. While designed for self-paced learning, Amatrol’s learning programs are equally effective in traditional classroom settings.

Industry 4.0 Fundamentals
Complete four-semester program

Designed to attract students who may never have considered manufacturing as a course of study or career focus and includes the opportunity for students to earn an industry certification.

Career Exploration with Skill Development
IGNITE’s innovative curriculum supports a modular 6-course Advanced Manufacturing program with additional materials science activities for science courses. Each course can be completed in one semester, providing flexibility for 1-, 2-, or 3-year programs.

All IGNITE courses include stimulating interactive eLearning lessons, computer simulations, design projects, and hands-on workstations using Industry 4.0 technologies.
Industrial Skills Trainers: Safety

Virtual Reality Simulation & Training

Workplace Safety
- AED
- CPR
- Fire Suppression
- Virus Vision

Industrial Safety
- Confined Space
- Fall Protection
- LOTO
- Fire Suppression

*Additional Modules*
- Stop the Bleed
- Hazwoper

*Contact us for availability.

People learn by doing. Virtual environments provide a safe, immersive and engaging experience where students learn behavior-based safety.

Full Suite of Training Products for Industrial Scenarios

Benefits of Virtual Reality Training

Including VR in your training courses may sound a little too far-fetched, especially if you’re new to it. Taking the leap from traditional training programs to immersive learning can be a big change for many educators. We are here to help you define your training goals, and find the best solutions to achieve them.

1. Increases learner engagement
2. Increases retention rate
3. Helps learners gain proficiency faster
4. Improves employee performance
5. Reduces costs
6. Allows learners to practice in a safe environment

Teach Industrial LOTO Training Hands-On

DAC Worldwide’s Lock-Out/Tag-Out Training System (811-000) features a realistic, simulated working process environment that facilitates introductory training with hands-on activities related to the process of identifying and locking out sources of dangerous potential energy in an industrial setting.

Lock-Out/Tag-Out Training System

x-cal.us | 1-800-445-1088
PolyJet 3D Printers give you an amazing range of material options, and can even let you combine several materials in one 3D printed model. Do things you never thought possible with 3D printing, like simulated overmolding, flexible, multi-colored prototypes, ergonomic tooling, or simultaneous printing of diverse parts.

Benefits of PolyJet 3D Printing
Exceptional detail, surface smoothness and precision.

- Create smooth, detailed prototypes that convey final-product aesthetics.
- Produce accurate molds, jigs, fixtures and other manufacturing tools.
- Achieve complex shapes, intricate details and delicate features.
- Incorporate the widest variety of colors and materials into a single model.

J8 Series 3D Printers
Brilliant designs shouldn’t have limitations. Realize and elevate your ideas more quickly and precisely with Stratasys® J826™, J835™ and J850™ 3D printers — designed for all who design.

- Pantone Matching System (PMS) Colors.
- Multiple material selections means you can load up to seven materials at once.
- Double the number of print nozzles in print heads means you can produce ultra-smooth surfaces and fine details.

J55 Prime
From fast concept models to quality high-fidelity models, the office-friendly Stratasys J55 3D printer is an affordable option for maximum designer output.

J35 Pro
Get all the benefits of an in-house engineering-grade printer without the hassle thanks to a small footprint, low-maintenance design, and silent, odor-free operation.

Everything You Need to be Successful with 3D Printing in the Classroom

- Easy-to-use 3D printer package.
- Standards-aligned lesson plans and comprehensive curriculum.
- A seamless, classroom-ready workflow.
3D Printers: FDM

Stop fixing your 3D Printer. Start teaching with it.
F120 by Stratasys.

FDM Technology uses the same tried and tested thermoplastics found in traditional manufacturing processes. For applications that demand tight tolerances, toughness and environmental stability - or specialized properties like electrostatic dissipation, translucence, biocompatibility, VO flammability or FST ratings - there’s an FDM thermoplastic that can deliver.

Benefits of FDM Technology:
- Clean, simple-to-use and office-friendly
- Supported production-grade thermoplastics are mechanically and environmentally stable
- Printing complex geometries and cavities becomes possible

F 123 Series
Make prototyping smarter & easier
The award winning Stratasys F123 Series is easy to operate and maintain, whatever your level of experience.

F770
Large-capacity FDM printers
Offers the capacity and material variety to meet the demands of the manufacturing environment.

Additive Manufacturing Certification

x-cal.us | 1-800-445-1088
3D Printing in Healthcare

We offer 3D printing solutions for educators to develop clinically relevant, high-impact training models from real human anatomy. These models reduce limitations by allowing universities to train physicians in any environment, and closely simulate real human tissue properties without using highly processed cadavers and animals.

J5 MediJet™
Better planning, education, and testing – all on a smaller machine.

With multiple materials and multicolor capabilities, academic medical centers, hospitals, and medical device companies can 3D print brilliantly vivid pre-surgical planning models, education and training models, medical device development models, and drilling and cutting guides that are sterilizable and biocompatible – all on a certified system.

J750 Digital Anatomy Printer™ (DAP)
Unrivaled Accuracy, Realism and Functionality

Bring the look and feel of medical models to life. Whether used for surgeon training or to perform testing during device development, its models provide unmatched clinical versatility, mimicking human tissue’s appearance and response.

New Printing Technologies

Origin One
A transformative 3D printer enabling mass production of end-use parts in a diverse range of high-performance materials.

RPS Neo 800
Build large functional models, prototype patterns, and production parts with the state-of-the-art NEO800.

Stratasys H350
The SAF™ powered H350 3D printer gives you control of your production and costs. Grow your business through volume production with consistent end-use functional parts.
RenAM 500Q
Quad Laser AM System for High Productivity

The RenAM 500Q features four high-power 500 W lasers. Each can simultaneously access the whole powder bed surface to achieve higher build rates, vastly improving productivity and lowering cost per part. The RenAM 500Q features automated powder and waste handling systems that enable consistent process quality, reduce operator intervention time and ensure high system safety standards.

Reduced Build Volume (RBV)

The RBV is designed for users to easily change between materials for material development and experimentation. All Renishaw AM systems feature open parameter editing with over 142 parameters. RBV enables rapid real time testing of the parameters, speeding up material development iterations.

QuantAM File Preparation Software

Renishaw QuantAM is a dedicated file preparation software tool for Renishaw AM systems. With an intuitive workflow and easy navigation QuantAM accepts CAD exports in the form of .STL data and allows you to prepare your model for the AM process.

Benefits

- Component weight reduction
- Rapid design iterations
- Bespoke or customized items
- Multiple parts consolidation
- Reduce tooling costs
- Build complex geometries
- Increased design freedom

Desktop Metal

Desktop Metal is reinventing how engineering and manufacturing teams produce metal parts - from prototyping through mass production.

By investing in 3D printing, students can gain hands-on experience by designing and producing their own functional parts and build the skills needed for next-generation manufacturing careers.

BÖHLER AMPO

high quality powder and printing know how from the material expert
3D Scanning

Artec 3D scanners
Fast. Smart. Vital

Streamlining engineering, industrial manufacturing, healthcare, science and education, with high precision, easy-to-use 3D technology.

Visit x-cal.us/3d-scanners for more information.

Professional 3D Scanners

Our portable 3D scanners are engineered to easily be used by both experienced and first-time users, with expert guidance available during every stage of capture and post-processing. Advanced tracking ensures the best data capture possible and eliminates the need for using targets, which is a great time saver.

Artec Eva Lite
The most affordable hand-held 3D scanner for professional results. A good option for medical applications and creating customized healthcare solutions.

- Highly-accurate results
- Light, portable and safe to use
- Geometry only tracking and data capture

Artec Space Spider
High precision, portable metrological 3D scanning solution based on blue-light technology, perfect for capturing small objects with intricate details, such as a cylinder head, coins or a human ear.

- Up to 0.1 mm 3D resolution and up to 0.05 mm 3D accuracy
- Fast capturing speed and no need for targets

Artec Leo
Our fastest professional hand-held 3D scanner yet. Encompassing the latest technologies in data capture, transfer and processing, this untethered 3D solution will revolutionize your workflow.

- Real time on-screen 3D model projection and processing
- Wireless technology with an inbuilt touch screen and battery
Fume Extraction

BOFA offers a wide range of fume extraction systems for the Laser, Mechanical Engineering, Electronics, Printing, 3D Printing, Dental, Pharmaceutical and Beauty applications.

Innovation Solutions

Today's technology is advancing at an incredible rate. To be competitive in today's job market your students need to learn on the latest technologies they will encounter throughout their careers.
Anatomy Trainers

**Synthetic Bodies**

This line ranges from educational models for anatomical reference to advanced surgical simulators which breathe, bleed, and react like live patients. You can customize the models to meet a wide range of needs with various pathologies and injuries.

**SynDaver Anatomy Model:** an education-grade synthetic human cadaver complete with bones, joints, muscles, organs, and tendons.

**SynDaver Musculoskeletal Model:** includes all of the major skeletal and muscular structures present in typical human anatomy. It is an ideal alternative to cadavers in basic anatomy classes. The synthetic tissues better represent live tissue and can last virtually forever with proper maintenance.

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**Anatomy Arm**

SynAtomy anatomical models are manufactured from simplified versions of the synthetic human skeletal, muscle, vasculature, nerves, tendon, and fasciae. These education-grade skinless models include bones, fully articulating joints, muscles, tendons and protective storage case.

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**SynAtomy Wearable Airway Trainers**

SynDaver designed these lifelike medical training simulators to teach the skills associated with tube thoracostomy placement. Includes chest rise and fall.

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**SynDaver Surgical Model**

This surgical training model features complete and functional musculoskeletal, cardiovascular, respiratory, gastrointestinal, endocrine, and nervous systems based on CT, MRI, and ultrasound images of actual patients.

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**SynAtomy Task Trainers Available:**

- Wearable Simulators
- Basic Suturing Skills
- Anastomosis Skills
- Airway Trainers
- Vascular Trainers
- Suturing Skills
- Ultrasound Trainers
- Obstetrics & Gynecology
- Pumps & Accessories

Organ and veterinary models also available.
FANUC’s CNC Certified Education Training Program

With over 2.4 million systems installed, FANUC is the undeniable global leader in CNC controls. They provide their customers with the most innovative, reliable and high performance products, backed by world-class service and support. FANUC realizes it takes qualified machinists, programmers, and operators to maximize productivity. To meet this need, FANUC has developed the most robust CNC certified education training program in the industry. If you want to train students to be productive employees right out of the gate, upgrade your educational programs with FANUC Certified Education Training.

FANUC CNC Certification Cart

Tabletop CNC certification carts are portable machines with a FANUC CNC, so students can practice machine set up and operation, and bring their programs into reality by making parts. The certification carts can be easily moved since they fit through a standard doorway and use a standard wall outlet for power.

Carts are available in turning (lathe) configuration or machining (mill) configuration with optional tooling packages that correspond with the lab exercises in the FANUC education curriculum.

FANUC’S ROBODRILL

The versatile FANUC ROBODRILL can be used in many different fields. The high reliability and the long life of the ROBODRILL are guaranteed due to the robust and uncomplicated construction of the machine.

Due to the high speed cutting with FANUC 31i-B series of controls it is very easy to quickly machine precision parts with high accuracy. Because of the stiff machine construction, the ROBODRILL provides efficient and accurate machining operations like face milling, end milling and drilling.

The 10.4” screen, quick screen and the full keyboard make it possible to input data with minimal time and effort. An additional standard PCMCIA card slot is located next to the screen and makes it simple to use CF cards.

Acceleration and deceleration will be optimized as the control will read 30 blocks ahead in the AICCI mode. In this way the part can be machine extremely fast and precise.

Benefits of the ROBODRILL:
• Fast and reliable tool change mechanism
• Tool change time 1.6s chip to chip
• Revolving Turret with up to 21 tools
• Latest FANUC servo motor technology
• .004mm bi-directional repeatability

Introducing the New Standard for Speed, Precision and Productivity

FANUC’s new SCARA robots are ideal for high-speed, precision applications such as assembly, pick and place, testing/inspection and packaging processes.
Robotic Welding Trainer

ArcMate Cart Features:
- Tinted sides to protect classroom (helmet required)
- FANUC Arc Mate 50iD/7L
- FANUC R30iB Mate plus controller
- Robot work area guarded for student safety

FANUC ARC CERT (ArcMate Only)
- FANUC ARC CERT Gift in Kind Package for qualified schools
- FANUC Advanced Academic Software/ARC Bundle
- FANUC ARCTool Student Certificate Program

CRX Cart Features:
- Fenceless (helmet required)
- FANUC CRX 10iA
- FANUC R30iB Mate mini plus controller

Both versions Include:
- Welded construction
- Fully integrated collapsible mobile cart design that fits through standard 36” door
- Miller Welding Power Supply Program

Optional Miller all-in-one manual to robotic MIG wire weld gun designed for versatility and ease-of-use.

PLC/HMI Trainer

Pathway to CSM™ Connected Smart Factory
Rockwell Automation (Allen Bradley) CompactLogix control panel electrical project kit.
*Ready to use as a standalone OR integrate into any FANUC cart.
Fanuc’s Robotics’ Certified Education Robot Training or (CERT) program certifies instructors at high schools, trade schools, community colleges and other universities to train their students to program Fanuc robots through on-line and hands-on training courses using actual Fanuc Industrial Robots. This creates a tremendous opportunity for schools to expand their training to include a certification on a real, industrial robot from the number one robot manufacturer in the world!

**CERT Program Features and Options**

FANUC’s CERT carts are compact, portable, self-contained educational robotic labs used to train students how to program an industrial robot in a safe and controlled environment (optional table-top mounting available).

The CR-35iA, the first-ever force limited Collaborative Robot from FANUC, combines unrivaled strength with outstanding safety to make interactive robot/human collaboration possible for a much wider range of applications. This is the only Collaborative Robot in the world that can lift heavy objects, up to 35 kg.

**Advanced Manufacturing CERT Cell**

Partnering with FANUC to bring education the first collapsible fully integrated advanced automation cell. The AM Cert is the next level of training once the student has grasped the concepts of handling tool operation, vision and DCS that is offered through the fenced, fenceless or Cobot CERT solutions from FANUC. Buy as is or customize to suite your particular requirements!

**Machine Tending Education Cell Simulator**

The MTEC-SIM is a compact, budget friendly version of the MTEC and teaches programming of a robot to CNC machine tool in a simulated environment. This machine comes ready for mill and lathe operation with the robot moving a blank from a pick location to a simulated mill vice or lathe chuck in one compact cell.

Visit x-cal.us/apt for more information.
Amatrol’s Industrial Electrical Wiring Learning System (85-MT6) introduces learners to the basics of electrical wiring, such as wire termination, wire sizing, conduit sizing, terminal block installation, and wire splicing, as well as how to read and create electrical prints.

**Learning Topics**
- Introduction to Electrical Control Wiring
- Electrical Control System Wiring
- Pneumatic Control Circuit Wiring
- Electrical Prints
- Electric Panels
- Wiring Between Panels
- Wire Color Coding
- Wiring Between and Outside Panels
- Wire Bundling
- Electro-Pneumatic Valves
- Pneumatic Schematics
- Electro-Pneumatic System Installation

**Key Features**
- Industrial Standard Components
- Heavy Duty Welded Steel Workstation
- Industrial Standard Wiring
- Double-Sided Workstation

**Related Electrical Products**
- AC Electric Motors Control Systems and Training
- AC/DC Electrical Learning System - T7017A
- Electric Relay Control Unit - 90-EC1A
- Electrical Fabrication 1 Learning System - 950-ELF1
- Electrical Power Distribution Learning System - 85-MT7-B
- Electrical Wiring Training System - 850-MT6B
- Industrial Electrical Wiring Learning System - 85-MT6
- Industrial Wiring Schematic & Installation Training System
- Portable AC/DC Electrical Learning System - 990-ACDC1
- Portable Electric Relay Control Learning System – 990-EC1

![Optional Multimedia Curriculum](image1)
![Student Reference Guide](image2)
Amatrol offers an array of HVAC Learning Systems that enable students to develop technical skills in all areas of HVAC Industry technology. Amatrol combines basic knowledge with applied, hands-on skills to enable learners to develop the skills needed in modern HVAC Industry. Amatrol’s HVAC Industry Learning Systems are comprehensive, offering strong curriculum, equipment and multi-media to help instructors create those teachable moments where students grasp HVAC Industry concepts and how to really work with them.

In addition to learning systems geared toward post-secondary and industrial customers, Amatrol also offers systems specifically designed for high schools. One of the biggest challenges facing the workforce today is a skilled worker shortage. Because of this, Amatrol is dedicated to providing high schools with learning solutions that will cover applicable STEM knowledge and advanced manufacturing topics and skills.

NEW Hands-On HVAC/R Training Systems

Residential Heat Pump Troubleshooting Learning System
The T7100 is used to teach the critical skills needed when working with residential HVAC systems that use a heat pump and traditional ducting. Learners will work with real equipment, such as a heat pump condenser, heat pump air handler, Wifi-enabled thermostat, fuse box, ducting, and manifold. In addition, learners will use Amatrol’s interactive multimedia eLearning curriculum to cover a wide variety of fundamental residential heat pump topics, including thermostat operation, pressure and temperature measurements, component tests, and system troubleshooting.

Residential Mini-Split Heat Pump Learning System
The T7130 is used to teach the critical skills needed when working with residential ductless (“mini-split”) HVAC systems. Learners will work with real equipment, such as a heat pump condenser, evaporator unit, thermostat, panel-mounted gauges, and condensate pump. In addition, learners will use Amatrol’s interactive multimedia eLearning curriculum to cover a wide variety of fundamental topics, including remote controller adjustments, heating, and cooling modes, LED indicators, communication between units, and system troubleshooting.

Refrigerant Recovery and Charging Learning Systems for R-134a/R-410a
Learners will work with real equipment, such as a recovery machine, manifold gauges, submersible cooler, temperature probe, filter dryer, low side liquid charger, vacuum pump, and micron vacuum gauge. In addition, learners will use Amatrol’s interactive multimedia eLearning curriculum to cover a wide variety of refrigerant recovery and charging topics, including refrigerant fundamentals, leak detection, pressure, and temperature measurement, refrigerant recovery, and recycling, and refrigerant charging.
Basic Refrigeration Training System

Amatrol’s Basic Refrigeration Learning System (T7045) offers hands-on learning of a working refrigeration system in a compact tabletop unit. Skills delivered through this trainer are used by technicians in industrial, residential, and commercial HVAC/R settings, preparing learners for a continuously growing industry. This system is a fantastic starting point for future HVAC/R technicians as it covers both hands-on maintenance skills and technical refrigeration concepts and calculations.

The T7045 covers topics including temperature and pressure measurement, heat transfer, & phase change. Transparent sections in the refrigerant lines allow students to observe the refrigerant as it changes from gas to liquid as it travels through various components. Temperature and pressure gauges are installed in multiple locations providing students a better understanding of how the refrigeration cycle works. Industry-standard components ensure learners gain experience with operating, monitoring and adjusting refrigeration cycles on systems that they’ll see in the field.

HVAC Cutaways

DAC Worldwide’s HVAC cutaways enhance learning by providing a look inside components found in most HVAC systems including compressors, solenoids, and valves. On many of DAC Worldwide’s cutaways, functionality has been retained and a hand wheel provided to demonstrate low-speed manual operation.

Each cutaway is mounted on a modular, heavy-gauge steel baseplate and support assembly. For industrial training relevance, common models by well-known manufacturers are chosen.
Cyber Security Skills are in high demand as threats continue to plague enterprises around the world.

In today’s Global IT environment, CYBER SECURITY goes well beyond traditional network security.

Based on the National Institute of Standards Technology (NIST) - Cyber Security Frameworks, the new ETG/Marcraft Cyber Security Essentials - Concepts and Practices course covers both theory and hands on labs:

- Critical Infrastructure Security Systems and Devices
- Intelligent Computing and Controlling Devices and Systems Security
- Business Information Technology (IT) Network Security Systems and Techniques
- Industrial/Utility Industrial Control System (ICS) Networks and Devices Security
- Medical Network and Data System Security
- Ethical Hacking Roles and Tools

The latest vendor-neutral A+ and Network+ Certification programs from CompTIA are the crucial first step in developing the knowledge, ability and skills currently demanded by the IT industry.

More than 400,000 students and technicians have relied on Marcraft for IT training and Certification exam preparation.

“In short, America’s economic propriety in the 21st century will depend on cyber security.”

- THE WHITE HOUSE
Office of the Press Secretary

Prepare students to challenge ISACA Cybersecurity Fundamentals Certificate Exam!

IT Certifications

Microsoft Networking Fundamentals
MTA Exam 98-366
Introduction to Networking

Microsoft Security Fundamentals
MTA Exam 98-367
Introduction to Security
Cyber Security Essentials

CompTIA A+ Certification
Maintaining and Repairing PC’s

CompTIA Network+ Certification
Network+ Certification

ISACA Security Fundamentals Certificate
Cyber Security Essentials

CompTIA Healthcare IT Technician
Cyber Security Advanced Healthcare IT

CompTIA Security+
Cyber Security Essentials

Certified Ethical Hacker
Hacking, Cracking and Internet Jacking (Advanced hacking)

CompTIA Advanced Security Practitioner (CASP)
Advanced Enterprise Security

“Few job categories can match the explosive growth in demand for cyber security talent.” - CIO Journal
MINDS-i is rocking robotics education through a high-technology platform that is simple to use, extraordinarily durable, infinitely modifiable, and relevant for today.

MINDS-i’s vision of what robotics should be inspires their labs and curriculum: build a robot using patented quick-lock construction elements designed to be highly durable, infinitely modifiable, and undeniably equipped to achieve the best performance, no matter where the path leads.

Immersive Curriculum and Labs
MINDS-i encourages students to think like engineers and technicians to work collaboratively testing and improving designs. We support teachers with outstanding training, ongoing technical support, and project-based curriculum aligned to educational standards.

UAV Drones Lab
The appeal of UAVs (Unmanned Aerial Vehicles) draws students to explore programming, electromechanical systems, and aerodynamics. Students design, build, and program drones for aerial search and rescues, GPS-guided crop dusting, autonomous deliveries to remote locations, and other compelling industry-related challenges.

Electric Car Lab
This 1/12th scale electric car comes with all the electronics and hardware required to assemble the kit and includes easy-to-use visual instructions. This kit is also compatible with most hobby standard DC motors, gears, radio transmitters, servos, bodies, wheels, tires, and more.

Foundations to Robotics - 4x4 or 6x6
Introduce students to the foundations of robotics with easy to assemble and modify rovers that emphasize real-world applications. Working collaboratively using the Engineering Design Process, students build and program advanced robots to tackle challenges. As they explore mechanical engineering, electrical engineering, and programming, students also analyze the robot’s physics, mathematical and scientific elements.

More Options:
- Catapult Lab
- Arduino 2-in-1 Robot Kit
- Competition Kit
- Drone Cages
- Drone Gimbal Rig
- 2WD Race Car Kit

An interactive approach to STEM Education.
STEM Design Program

Programs that help students discover STEM career pathways

Our complete STEM curriculum works straight out of the box.

Aims of the Exploring STEM program

- Increase students’ enthusiasm for STEM through active, project-based learning
- Improve students’ understanding of basic concepts of engineering and technology
- Help students see the connections between the STEM subjects
- Expose students to a wide range of STEM career pathways
- Help students understand the diversity of applications of STEM in a wide range of different areas of industry and everyday life.
- Develop 21st Century Skills such as critical thinking, problem solving, creativity, team working, and the ability to process, question, and analyze information.

“One of the benefits of the program for the students is that it encourages them to do more critical thinking and problem solving; they really have to think about their answers.”

Mr. Leavernard Jones / Technology Teacher

Engineering

Ensure your students have the right skills for the job – our engineering program is designed to bridge the skills gap

Our engineering program comprises three main strands of Control and Instrumentation, Mechanical Engineering and Electronic Engineering. Our comprehensive program addresses a broad range of related engineering areas, including:

- Industrial Control Trainer
- Electrical Engineering
- Electronics
- Mechatronics
- Mechanical Engineering
- Engineering Science
- Engineering Materials Technology
- Manufacturing Techniques

“One of the reasons we really liked working with LJ Create was that they had so much to offer us in the way of engineering teaching resources.”

Lynne Spinarto
Technology Chair Person at MacArthur High School

Contact us for a FREE demo of our online library!
LJ Create Automotive

Our practical NATEF-aligned programs take your students from beginner to shop-ready

This program has been designed to allow you to build a NATEF certified automotive program that will enable your students to become new hi-tech auto technicians.

A unique blend of online digital learning resources and practical equipment combines to create an automotive teaching program that will deliver the knowledge and practical skills students need to achieve success.

The learning content is continually updated to meet NATEF standards - at MLR, AST, and MAST levels!

Automotive theory taught in a practical way

- Sectioned Components
- Autotronics Panel Trainers
- Autotronics Boards
- System and Component Rigs
- Medium/Heavy Truck Rigs

"It's totally different here, we've got computers and all these trainers. It's an excellent way to learn and is much better than just reading books. We have our own laptops so I can go home and study, so when I come in here I can get 100%!"

- Alex Diaz, Automotive Student
ASE L3 Trainer Light Duty Hybrid/Electric Vehicle Specialist
Prepare your students for the ASE L3 test!
All topics related to the New ASE L3 test are now covered by our newest Hybrid/Electric vehicle trainer. Allow your students to build confidence by knowing they can safely work on a state-of-the-art real-world system performing the procedures needed to work on hybrid/electric vehicles.

TruckTrain Heavy Duty Hybrid/Electric Vehicle
Train for truck and agricultural machines.
To prepare students for electrification of the powertrain in commercial vehicles, the renowned HV training system for passenger cars from Lucas-Nülle has been modified and adapted. The special learning concept of the training system, which combines theoretical and practical content in a target group-oriented manner, enables flexible on-site implementation that is taking regional, operational, and industry-specific features into account.

CarTrain Diagnosis and Maintenance of a High Voltage Battery
This training system focuses on the digitally networked CAN-bus battery management system in a traction battery and on the corresponding components.

TruckTrain Smart Farming 4.0
Precision Farming with Section Control (ISO BUS)
This training system from the TruckTrain series focuses on the topic of “Smart Farming 4.0” based on the ISO bus. Special attention is paid to the function of “Precision Farming with Section Control”, which is implemented in the hardware in a practical and interactive way.
Heavy Equipment Simulation Training

Teach Heavy Equipment operations safely and cost-effectively with Simlog’s 10 PC-based Personal Simulators for Construction, Mining and Forestry. Each simulator leverages the power of today’s off-the-shelf (Windows) PCs to finally provide truly cost-effective help for training heavy equipment operators. Choose the USB-ready replica controls or the OEM Industrial Chair option and you can begin training in minutes!

Add Simulation Manager software to track each student’s results and competencies as they progress through the training.

With Simlog, your students will be learning the right way to do things, thanks to “best practices” input from our OEM partners and training professionals just like you. So you’ll find the right kind of simulated tasks, the right kind of task progression, and the right way of evaluating the simulated work.

Getting Started is Easy!

- Select the Personal Simulators that fit your program
- Choose the right USB Replica Controls for your setup
- Identify a suitable desktop or laptop PC and video display

Also Available: Mobile Crane, Tower Crane, Off-Highway Truck, Mining Truck, Electric Rope Shovel, Drill Jumbo, Forwarder, Harvester, Material Handler, Reach Lift Truck, Backhoe Loader, Wheeled Material Handler
**Desktop Simulator: Vortex Edge Plus**

Optimally designed for simple transport and set-up, the desktop Vortex Edge Plus makes it easy and affordable for training organizations to run CM Labs’ full catalog of construction equipment training modules.

All CM Labs simulators can also be connected to enable cooperative crew training exercises.

**Entry-Level Motion Simulator: Vortex Edge Max**

Not every organization has the time, manpower, or equipment available for training when needed. That all changes with the Vortex Edge Max. Packed with CM Labs’ award-winning technology, the Vortex Edge Max simulator is an entry-level tool that develops transferable operator skills.

With a rugged, stripped down design that minimizes simulator costs, the Vortex Edge Max is built to the same uncompromising standard that has made CM Labs the largest construction simulator vendor in the world. The Vortex Edge Max can also be connected with other CM Labs simulators to enable cooperative crew training exercises. Easy to transport, set up, and use.

**Complete Heavy Equipment Operator Training**

The Vortex Edge Max comes bundled with a full fleet of cranes, a complete earthmoving catalog, or both, for a total of 10 machines on one simulator.

Its heavy-duty controls are design to run any machine, and the screen rotates to provide an optimal field of view for every piece of equipment.

**Real-world learning**

With a motion platform that replicates the feel of the real equipment, best-in-class visuals, and exercises that replicate work site conditions, the Vortex Edge Max prepares trainees for the real world.

It comes fully embedded with CM Labs’ Smart Training Technology™. Smart Training Technology results in solutions that deliver the most transferable operator skills anywhere, outside the real equipment.

Incorporating the Vortex Edge Max into your training reduces fuel emissions compared to training on the real equipment, while teaching operators how to operate machines efficiently and with minimal idle time.

**Maximum learning effectiveness**

The Vortex Edge Max logs key performance metrics, so operators learn productive machine use. Self-guided learning paths — from beginner to advanced — mean operators can train even when equipment or trainers are unavailable. Trainees can learn to operate equipment and practice challenging real-world scenarios, with no risk to equipment or themselves.

In addition, the Vortex Edge Max can connect to other simulators for tandem operations.
Virtual Reality Training Tool for Painters and Coaters

SimSpray is the leading training tool for the painting and coating industry. It’s an easy-to-use, turn-key training tool that provides accessible hands-on experiences with virtual reality simulations. Transform paint training with SimSpray for objective performance analysis, customizable training curriculum, and an engaging recruitment tool.

SimSpray has been shown to save up to 50% of training costs and train proficient workers faster. Train students in a fun, engaging way, and prepare them with the core skills they’ll need on the job.

Real-Time Tracking: Integrated, camera-based, visual tracking with easy-to-use deployment steps.

Display: Mounted monitor with touch screen controls and additional HDMI output for external displays.

HMD: High-quality, immersive, and ergonomic professional-grade headset.

Spray Equipment: Weighted spray gun, powder gun, or abrasive blasting hose with functional controls.

Case: Lightweight, compact design with convenient component storage and easy setup.

Training Content & Features

Processes
- HVLP
- HVLP Conveyor
- Airless
- Airless Conveyor
- Air-Assisted Airless
- Air-Assisted Airless Conveyor
- Powder Coating
- Powder Coating Conveyor
- Abrasive Blasting

Techniques
- Applicator Speed (Cue)
- Spray Angle (Cue)
- Part Distance (Cue)
- Transfer Efficiency
- Mil Build
- Defect Identification
- HVLP Edge-Blending
- Painting on Conveyor

Parts
- Automotive
- Aerospace
- Construction
- Heavy Equipment
- Industrial Components
- ASTM Panels (American Standards of Testing & Measurement)
- Basic Panels

SimSpray Go Portable Painter Training

A compact, affordable virtual reality paint training tool that offers a lightweight and portable training experience, SimSpray Go is our newest innovation for VR paint training. This out-of-the-box, tabletop VR painter training tool offers efficiency and effectiveness for your HVLP training programs. SimSpray Go delivers all the training benefits of virtual reality at a budget-friendly price point.
Port Crane Simulators

Utilizing simulators in the classroom allows you to deliver professional training at a lower cost to your students. Port Crane simulators provide flexible solutions to meet your educational needs with a wide variety of options to choose from.

These simulators replicate a wide variety of operating conditions to give students hands-on experience operating cranes in difficult and demanding conditions. These state-of-the-art Port Crane simulators provide a realistic 3D solution which deliver all the benefits of actually operating the port crane. Also, we provide quality maintenance and support to keep your training at peak performance.

- Real-time - hands on training
- Realistic sights, sounds and motion
- User-Friendly Instructor stations
- Cost-effective solutions
- Absolute confidence

Wärtsilä Navigation and Bridge Simulators by Transas

Wärtsilä Simulation & Training solutions connect maritime stakeholders by providing integrated solutions and high quality content that bridges the gap between STCW and required level of competency.

Complete Solutions

- Wärtsilä Academy supports training providers throughout the whole process: Training need analysis (TNA)
- Selecting the right simulation technology
- Design of training facilities; consultancy on infrastructure works
- Turnkey project management and deployment
- Customized development for specific applications
- Train-the-trainer courses
- Certification support
- Customized maintenance and support services
- Courseware and training content development and delivery

Products Available

- Navigation and Bridge Simulators
- Technological Simulators
- Vessel Traffic Systems Simulators
- Simulation Development Tools
Welding instructor and educator tools to bridge the manufacturing skills gap.

Lincoln Electric is the world leader in the design, development and manufacture of arc welding products. In addition to being the industry standard for welding equipment and supplies, Lincoln Electric also develops and supplies Welding Training Simulators and supplies. We are proud to represent Lincoln’s line of educational Welding Simulators and is your Authorized Educational Reseller.

**VRTEX® Trainers**

Lincoln Electric’s VRTEX® virtual reality arc welding trainers provide a powerful, cutting-edge solution for cultivating welding talent quickly and resourcefully. From superior graphics creating the most realistic and responsive welding puddles available, to exceptionally accurate sounds and movements, what can be learned virtually with VRTEX® seamlessly transfers into real-world, hands-on welding training.

**VRTEX® Engage™**

This standalone system, designed to introduce basic skill trades to students in non-traditional academic settings, gives users a taste of the more advance VRTEX system designed specifically for welding training.

**VRTEX® Transport™**

A basic, entry-level welding training system designed to provide mobility in an easy to use and engaging welding training tool. Ideal for initial, basic welding training, as a recruitment and engagement tool or as an evaluation tool for instructors and educators.

**VRTEX® 360**

An advanced level welding training system. It is designed to provide a full featured, expandable platform in an easy to use and engaging welding training tool.

**REALWELD® Trainers**

With the REALWELD® Trainer in your welding booth, students can practice Stick, MIG and Flux-Cored arc welding, while receiving audio coaching and weld performance tracking on 5 key parameters. It’s like having a teacher’s assistant right in the booth helping to advance every student toward their career goals.

**Robotic Trainers**

Robotic welding training solutions focus on enhancing the ability to train on robotic programming, welding technique and skills.
The X-Cal Difference

For new construction and renovation projects, X-Cal combines a clear vision of your goals with our professional consulting, planning, implementation and support services, to maximize your results:

**Consulting**

Before the space planning begins, our staff will meet with you to understand your objectives, and help to define a successful and sustainable program implementation.

**Planning**

Next, we will assist in the careful planning of a total learning environment – not just a “lab.” We’ll work with your team and architects to help layout your space, and provide you with detailed lab drawings and product specifications.

**Implementation**

When your building is ready, our factory-trained technicians will complete your furniture and equipment installation on time, and within budget. And our manufacturing partners will provide effective professional development for your faculty and lab support staff, either on-site or at our training facilities.

**Support**

Once your program is up-and-running, our team of outside service technicians and inside support staff will work with you to ensure that your program continues to function as specified, and is kept up-to-date, for many years to come.

Our mission is to provide cutting edge technology, equipment and curriculum that will help every learner achieve success in the world of tomorrow.