Thank you for choosing Miller Welding Automation products and recognizing effective technical training is a key element in the purchase of the robotic cell. Our goal is to create training courses that result in productive and knowledgable robot operators.

The following pages contain information regarding:

- Courses offered
- Course overview
- Course fees
- How to schedule training

If you have questions, please feel free to contact us. Additional information may also be viewed on our Website at www.millerwelds.com/automation.
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281 E Lies Road
Carol Stream, IL
United States

2-2900 ARGENTIA RD
Mississauga, ON
Canada
Operation Training
Cost - $1,750.00/student

Maintenance
Cost - $2,000.00/student

Heavy Plate
Cost - $2,500.00/student

CRAW
Certified Robotic Arc Welder
Cost - $1,800.00/student
AWS fees not included

Offline Programming
DTPS
Cost - $4,500.00/Up to two students

Specialized Training
Cost - $1,800.00/student (3-day)
Cost - $1,500.00/student (2-day)

Onsite Training
Cost - $150/hour + Expenses

Time determined by scope of training. For more details contact:
james.manning@millerwelds.com
Basic Robot Operations

The Basic Operations course is an introduction to teach pendant controls and functions. Emphasis is placed on programming, editing, and navigating basic teach pendant setup. Trainees learn guidelines to implementing a new application into production as well as basic maintenance procedures. The course offers a balance of theory and hands-on labs to ensure students gain a broad understanding of the production process and can apply their learning to real-world applications. Safety is a key concern both in the training environment and production floor and is repeatedly reinforced throughout the program.

Course Objectives

- Identify safety features of robot and system
- Program linear, circle, and weave welds
- Demonstrate knowledge of editing programs
- Complete the new application process
- Understand basic concepts of robot commands

- Prerequisites: None
- Course Length: 4.5 Days
- Tuition: $1750
Certified Robotic Arc Welding

Course Overview
Miller Welding Automation is an (AWS) Approved Test Center for the certification testing for Robotic Arc Welding – Operators and Technicians. This certification allows welding personnel employed in various welding sectors to measure themselves against standards for their occupation. It also signifies that the CRAW Operator or Technician has demonstrated the capability of working with various codes, standards, and specifications. Since proof of active practice or re-examination is required every three years, certification also signifies that the CRAW Operator or Technician is current with the welding industry.

Study materials will be mailed to students upon registration. To ensure ample study time, we encourage you to register for class at least six weeks in advance.

Course Objectives
• Demonstrate safe operation a robotic welding system
• Understand welding processes and parameters
• Perform an overview of non-destructive testing
• Have an understanding of weld consumable
• Knowledge of select AWS specifications

Examination: Students complete a multiple choice exam of 136 questions. A 75% score is required to pass the exam.

Practical Exam: Pass a performance test that covers the practical demonstration of knowledge and ability involving a robotic system.

• Prerequisites: AWS Standards • Course Length: 5 Days • Tuition: $1800*
  *AWS fees not included
Customized Robot Training

Customized courses are designed to cover robotic features that fall outside of the scope of the current course offerings. Each class is specifically designed to meet the training needs of the customer. A matrix of training objectives for every training module is used to build the course to ensure students have a thorough understanding of each training module that encompasses the course.

Course are 2 or 3 days based upon training objectives. A minimum of two students required before a course will take place.

The following is a list of training modules available.

- External axis/harmonic motion (setup & operation/robotic applications)
- 3D Touch sense (setup & operation/robotic applications)
- Arc touch-sense/seam tracking (setup and operation/robotic applications)
- Dual robot configuration and programming
- Aluminum welding
- MIG-Force (Servo Push/Pull)
- Advance Input/Output
- Tandem Torch
- Active Wire Process
- Stainless steel welding
- Standard touch sensor
- TAWERS commands
- Advance logic programming

- Prerequisites: Basic Operations
- Course Length: 2 or 3 Days
- Tuition: $1800 (3-Days) | $1500 (2-Days)
Robot Maintenance

Robot maintenance training is designed for those with the corrective and preventative maintenance responsibilities of the robot system.

The course stresses the importance of preventive maintenance while providing the skills necessary to troubleshoot problems and quickly resolve machine down time. The students develop a thorough understanding of electrical and mechanical components with hands-on training labs.

- Prerequisites: None
- Course Length: 3 Days
- Tuition: $2000
Heavy Plate Programming

This course offers a comprehensive introduction to the heavy plate software. Students learn the principles behind adaptive weaving, menu weld programming, multipass welding and touch sensor procedures.

Course Objectives
- Arc touch-sense/seam tracking (setup and operation/robotic applications)
- Heavy plate process (setup & operation/robotic applications)
- Menu welding
- Touch-sense menu organization
- Advance touch-sense programming
- Adaptive fill welding
- Recombination of welds programming

- Prerequisites: Basic Operations
- Course Length: 4 Days
- Tuition: $2500
Additional Training Courses

**Arc Touch Sense / Seam Tracking**
Students learn to setup all parameters required for successful arc sensing and seam tracking, ensuring high quality welds on even the most inconsistent materials.

**Robotic TIG Welding**
This course teaches the process of welding using a tungsten electrode. During the training the student will receive instruction and extensive hands-on opportunities to develop the skills required to demonstrate proficiency of robotic TIG welding.

**Coordinated Motion**
This course teaches the skills and knowledge required to generate robotic welding programs using external servo driven axis. Training modules covering touch sense with coordinated motion are available.

**Aluminum Welding Optimization**
This course teaches the sequence commands associated with welding aluminum applications. The curriculum also covers techniques including base-metal preparation, preheating, shielding gas, welding wire, and programming techniques related to aluminum robotic programming.

**Active Wire Process**
Active Wire Feed Process (AWP) is born from TAWERS “Fusion” technology developed for further improving welding quality. This course teaches the principles behind welding with AWP and setting weld parameters.

**Dual Robot Operation**
This course covers the basics of slave robot control, advance Input/Output programming, and programming with handshakes. System operation and troubleshooting is also a part of the training.

**Waveform Development**
This course teaches the programmers how to input the sequence commands that impact the waveform of the arc. A series of labs allow users to understand the impact each sequence command adjustment has on the arc. The course also includes an overview of how to adjust the waveform for each welder profile.
Offline Programming

Desktop Programming (DTPS)

This course is designed to instruct the student in the use of the “Offline” program generation software. This software allows the development of programs offline minimizing robot downtime and maximizing throughput and productivity. This specialized software allows the generation of programs and simulates the actual taught paths from your desktop.

DTPS training includes four day course at Carol Stream facilities and 8 hours of onsite instructor led training.

Offline Programming (DTPS): Learning Objectives

- Data Structure within DTPS
- Drawing Parts in DTPS
- Importing CAD files
- Setting up a system (Installation Editor)
- External Axis Editor
- Offline Programming
- Drawing Weld Lines
- Programming offline
- Cycle Time analysis
- Reach Studies
- Collision Detection
- Mastering System from Virtual to Real World
- Calibration of your Robotic
- Welding System
- Aligning Program from DTPS to Real System
- Dimension Lines
- Additional Features
The ability to program offline and perform reach studies.

Import CAD files or draw parts in DTPS.

Build welding systems and master virtual world to real world.
For new robotic purchases, we recommend you receive training no more than 3 weeks prior to installation of the system.

**Before you register, be sure you know:**
- Installation date in order to pick the class date closest to your installation date.
- The course in which you wish to enroll.
- The number of students you wish to enroll.
- Job Number if using training credits included in the “Smart Start” package.
- Payment must be made at the time of registration using a credit card.
- Purchase Orders option available.

Register at: [www.millerwelds.com/automation](http://www.millerwelds.com/automation)

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**Who Should Attend**

One or more recommended pre-requisites include:

- Proficiency with Windows applications
- Previous robot programming experience
- Mechanical drawing (AutoCad, Solid Works, etc)
- Robotic operations
- CNC programming

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**Training philosophy and principles**

1. **Clearly defined performance objectives:** We design each course to meet their learning objectives as well as meet customer expectations.
2. **Ample practice and feedback:** Each student is assured time with the robots. Our creative lab work allow for better retention and understanding.
3. **Focus on customer needs:** Our courses are flexible, allowing instructors the opportunity to address specific customer concerns.
4. **Well equipped training facility:** The goal is to ensure that students learn on the equipment that they will use on the daily basis.
5. **Assessment and Measurement:** We evaluate each course based on student achievement, student evaluations and customer feedback.
Learning by Doing = More Hands On

Learning by doing is the fundamental approach to our training philosophy. Students advance their knowledge through a series of exercises and labs where they are able to practice and apply each learning objective. Our goal is 80 percent hands-on and 20 percent classroom lecture.