YASKAWA ACADEMY

Training Overview

www.yaskawa.co.uk

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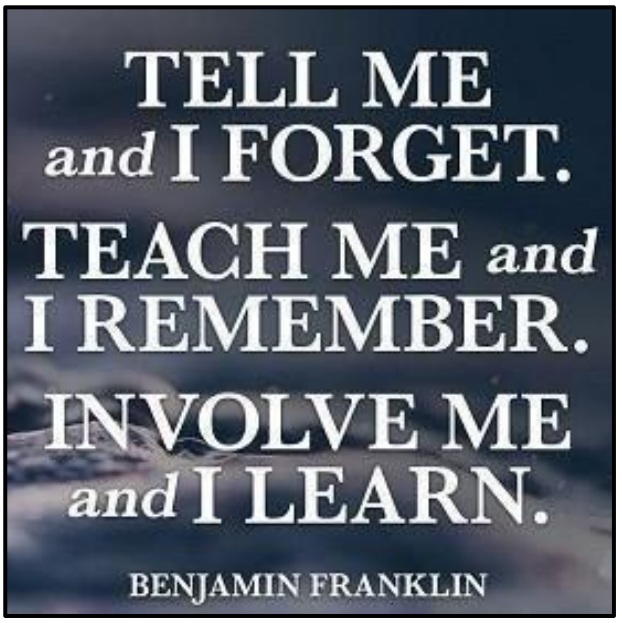
What to expect at Yaskawa Academy?

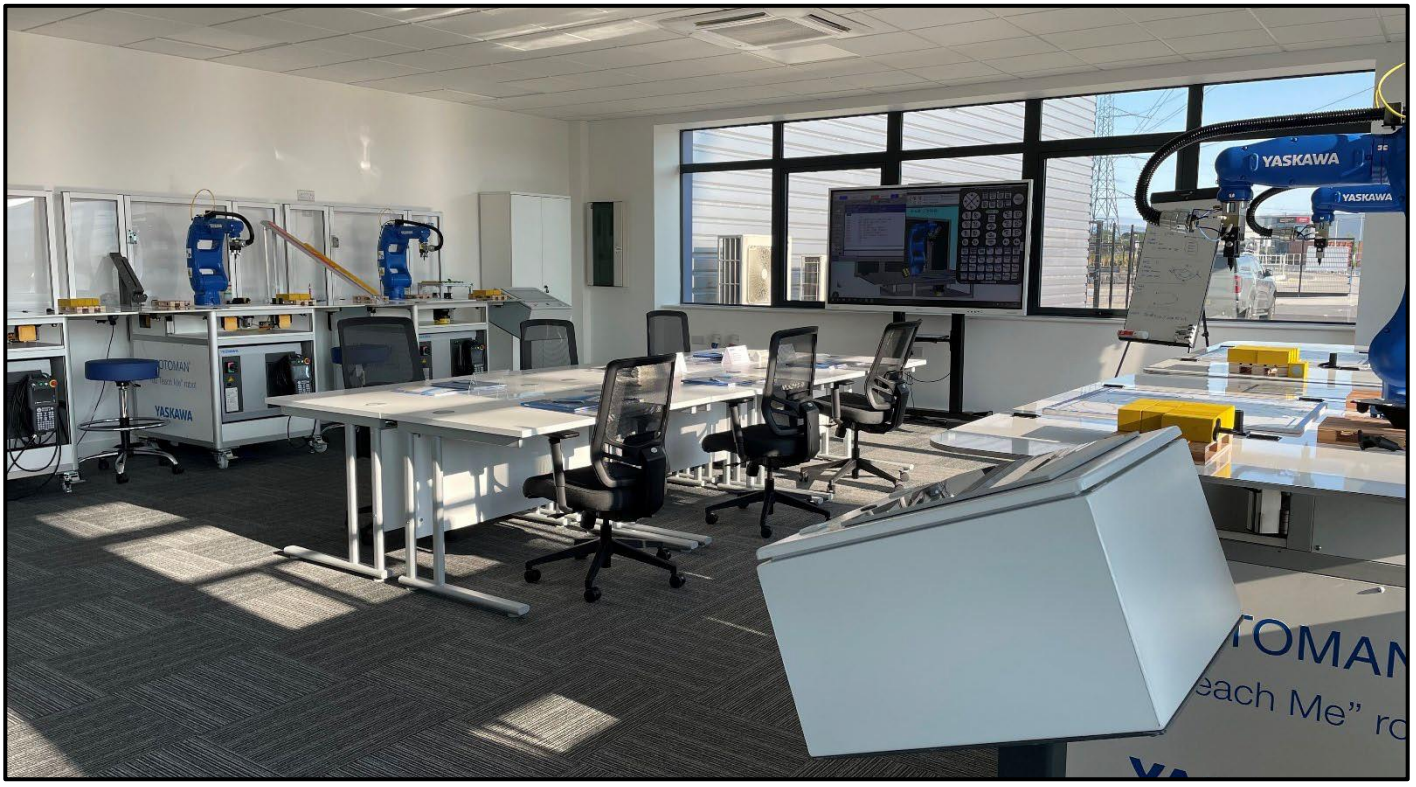
We strive to create an informal and stress free training environment, only if you feel comfortable and relaxed, can you then fully focus on your training.
During the training and even during breaks - everything is taken care of.

Our quality requirements towards our training:
- Limited number of participants in the course so that you get the most out of your training
- 1 robot system for a maximum of 2 participants so that everyone gets the maximum hands on experience.
- Targeted theory kept to a minimum during each day.
- Interesting exercises to make you think for yourself.

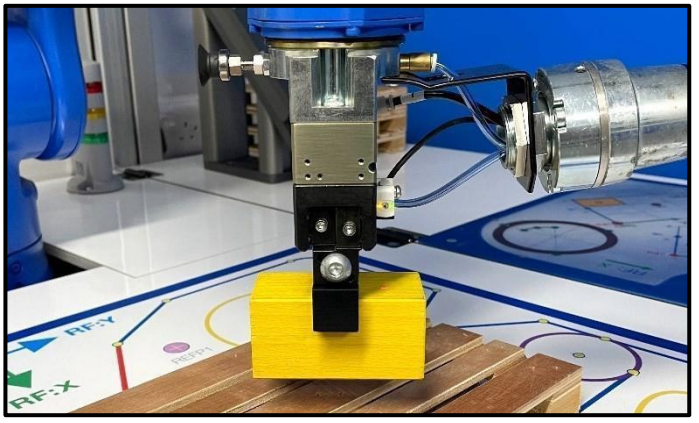
Our quality requirements towards our learning environment:
- Air-conditioned training room
- Versatile robot technology with different applications
- A selection of hot and cold drinks
- 1 Hour to enjoy lunch.

Our quality requirements towards our trainers:
- Polite, friendly, helpful, and patient
- Prepared for your training
- Always ready to answer any questions
- We take our time – if you need more time, we won't rush.





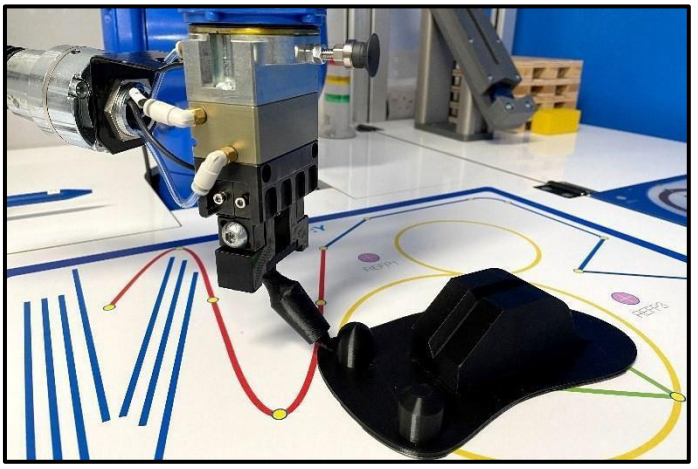
What to expect at Yaskawa Academy?



Functionality that reflects real-world applications:

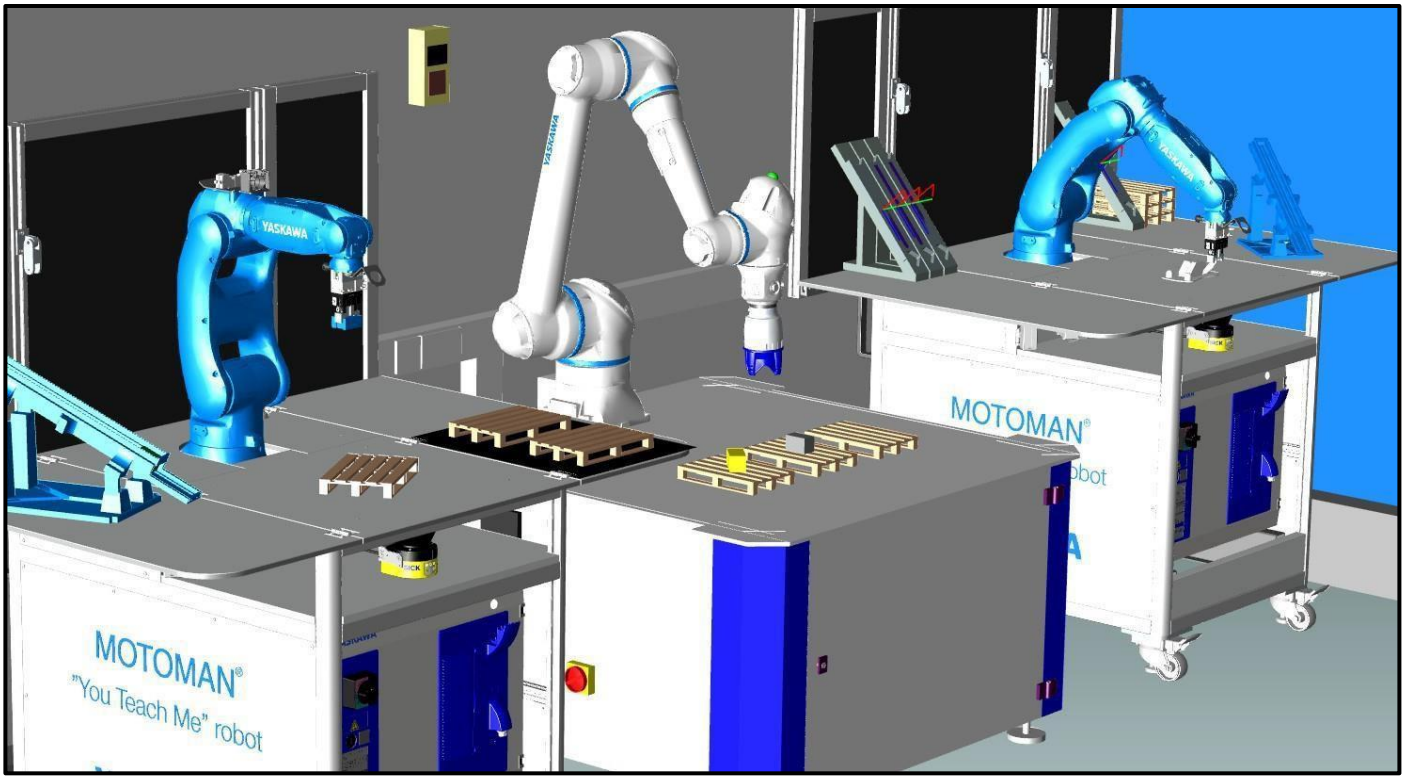
All the Academy GP8 training robots are fitted with:

- A vacuum system for handling applications
- A pneumatic gripper for handling applications
- A laser sensor for Search applications
- An interactive HMI (Human Machine Interface) with built in Input and Output functions



Interactive models that represent common handling and arc welding applications:

- Scale models of Euro Pallets
- Wooden blocks of differing sizes to represent handling and palletizing of different products
- Gravity slides to represent conveyor systems
- 3D printed models representing welding torches
- 3D printed models designed to represent typical shapes and product contours found in arc welding



My Generation:
Robot Controller and Application.

“Good training is a journey with a reward”

What generation is your controller?

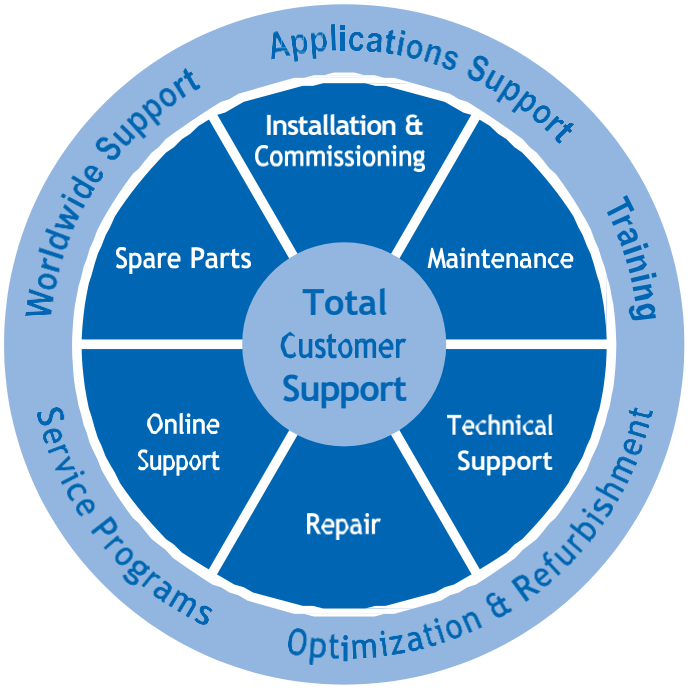
YASKAWA is known for never introducing a complete make-over for new controller generations.
Reliable components are maintained. We only work on those areas where there is room for further optimization or technical improvement. The advantage for you is that once you have learned how to program, you can handle different controller generations. Each generation group uses the same programming pendant – that’s why we divide our controllers into controller groups. Within a generation group, differences are quite marginal.

Generation NX		Generation DX			Generation YRC		SMART Pendant
							
NX100	NXC100	DX100	FS100	DX200	YRC1000	YRC1000 micro	
							

Workforce knowledge is your key to success.

Training is a sound investment that allows you to get more out of your robot cell.

At our YASKAWA Training Academy we blend theory with repeated hands on practice so the trainees can successfully apply their knowledge into your robotic production system.



Our training courses are divided into the following six colour-coded areas:

In addition to our standard courses, we offer bespoke customized training, in which we can cater for customer specific requirements and equipment,

Our "Training Overview" on the following pages will assist you in finding a suitable training course(s).

For more information, events, and current training courses please look in the field of YASKAWA ACADEMY under:

http://yaskawa.co.uk/services/training/Locations

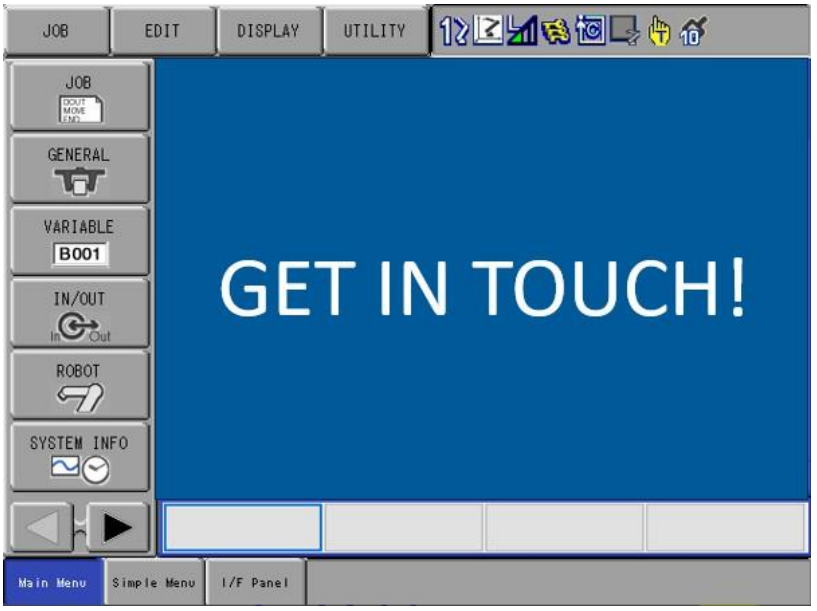
Structure and Basis of Training

		Page
Training for everyone	Here you will find the basics for interested people who have not yet had any contact with this technology and would like to gain an insight	9
Robot Programming BASIC	Basic programming Standard Basic programming + Handling Basic programming + Welding Basic programming + Maintenance	10
Robot Programming ADVANCED	Depending on your programming requirements, you will find various advanced topics that will provide you with the necessary knowledge for your robot application	11
Functional Safety	Functional safety training can be found here	12
Maintenance	Basic mechanical and electrical troubleshooting, Robot setup, calibration, greasing and battery replacement. You will find the ideal training for your product.	13
Robot Software	We can offer MotoSim VRC software training. Basic Motosim course and Module 1 (External and Base Axis) are available.	14

FOR YASKAWA TRAINING COURSES

CALL: +44 (0) 330 678 1990

EMAIL: training.uk@yaskawa.eu



Break the Code

What is the meaning of the training codes and signs ?

Explanation of the tables on the following pages

Training code and name	RB1AP	Basic Robot Appreciation
Duration (days)	2	Safe and proper operation of a robot.
Number of participants (min./max.)	2– 4	
Target group		Robot operators / Beginners
Prerequisites		None
Controller		Generation NX, DX, YRC
Training location		Training Academy Washington, On-site

RB1MDGB

Division	Training Level	Number	Related specification	Generation	Language
R = Robotics	B = Basic	Current Training Group Number	AP = Appreciation		E = English
	A = Advanced		RC = Refresh/ Conversion	N = NX 100 or NXC100	
	S = Safety		P = Programming	D = DX100, FS100 or DX200	
	O = On-site		PH = Prog+Handling	Y = YRC 1000 or YRC 1000 micro	
	FT = Free Training		PW = Prog+Welding		
	CT = Customised		PM = Prog+Maint		
			S = Safety		
			M = Maintenance		
			SO = Software		

Training for everyone

Robotics for Beginners

If you have no special knowledge of Robotics technology and would like to get a first impression of the world of Robotics, then our **"For everyone"** courses are just perfect for you.

Regardless of whether you are new to Robotics, you haven't worked on one for some time or you're stepping up to a different generation – we will introduce you to the fantastic world of Robotics in just two days.

You will get a basic insight into how everything works. At the end of the training, you will be able to safely move the Robot in manual with the Teach Pendant, understand the basic concepts of Robotics technology, and the possibilities it offers.

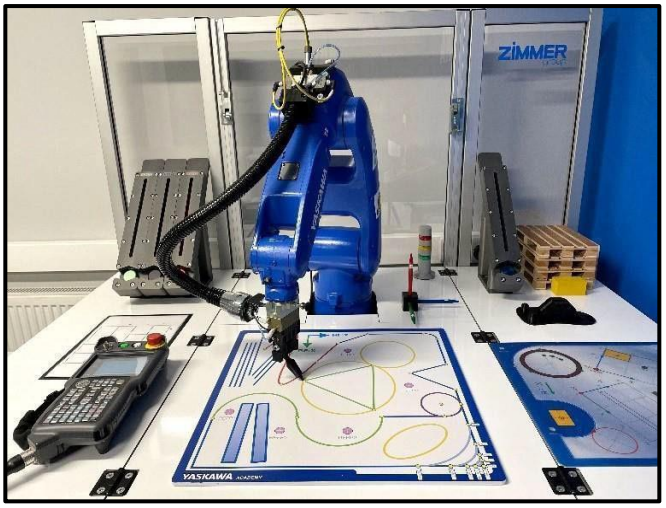
Our Crash Recovery training provides you with the skills and understanding to successfully recover your robot from a crash scenario and reduce crash-related downtime. For welding customers, we also cover the Shock Sensor function and recovery.

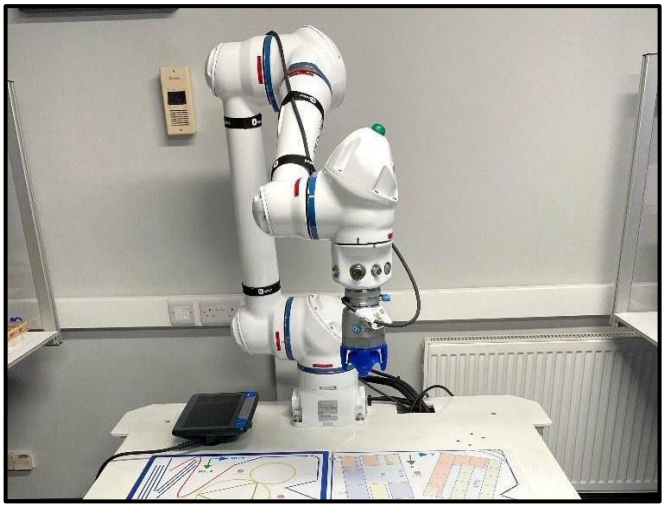
RB1AP	Robot Appreciation
2 2–8	We offer an insight into the world of YASKAWA robotics for anyone who has not yet worked with industrial robots but finds the topic interesting. We will show you how to manually control a robot.
	Anyone curious or interested
	None
	Training Academy Washington

RB1R	Robot Refresher
2 2–8	If you are a little Robot rusty, this course will soon get you back on track. An overview of the Robot and ancillary equipment.
	Existing Robot users
	None
	Training Academy Washington

RB1C	Robot Conversion
2 2–8	Existing knowledge of older controllers is updated to the current generation and new functions and settings are explained.
	Existing Yaskawa Robot users.
	Technical understanding
	Training Academy Washington

RB1CR	Robot Crash Recovery
1 2–8	Here you will learn about the Collision Detection function and how to recover your robot from a crash, including manual jogging of the robot. For welding customers, we also cover the Shock Sensor function and recovery procedure.
	Existing Robot users
	None
	Training Academy Washington





Basic Programming Courses:

The Journey is the Reward

Arc Welding • Cutting • Bonding • Dosing • Sealing • Deburring • Grinding • Polishing • Handling and much more.

Basic Programming courses provide the knowledge required to program robot applications where the application is a movement and therefore a programmed path is required.

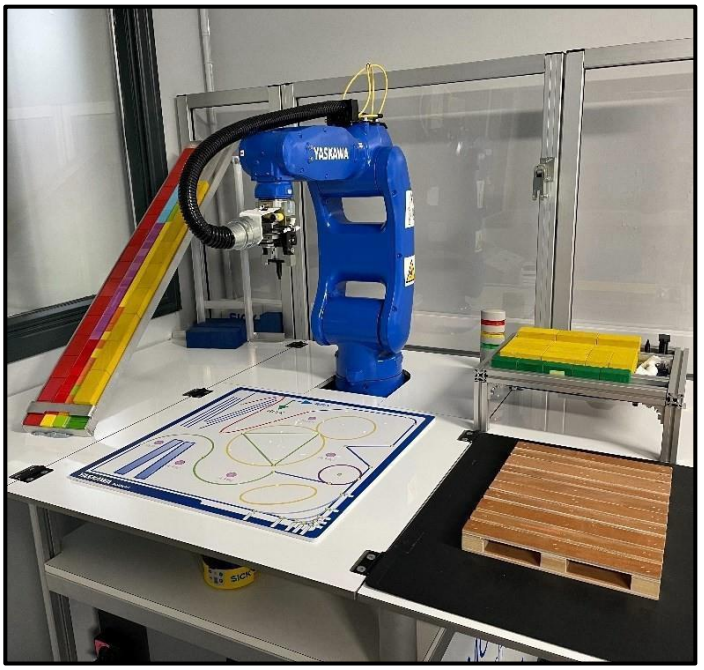
An insight into how the Robot interacts with external signals provides a good grounding for all Robot applications.

RB2P	Basic Programming (Standard)
3.5 2–6	Safe and correct manual operation of a robot. Basic knowledge of robotics. Creating simple programs, Program editing, using I/O, system fundamentals, data backup.
	System integrators, Engineers, Robot operators
	None
	Generation NX, DX, YRC
	Training Academy Washington, On-site

RB2PH	Basic Programming & Handling.
4.5 2–6	Includes all the topics covered in the Standard course. Additional Handling related content includes practical handling programming exercises using integrated gripper and vacuum tools.
	Programmers, Engineers, System integrators
	None
	Generation NX, DX, YRC
	Training Academy Washington, On-site

RB2PM	Basic Programming & Maintenance.
4.5 2–6	Intended for electrical or mechanical personnel. Includes all the topics covered in the Standard course. Additional Maintenance content includes greasing procedures, servo motor replacement, robot calibration, system data backup and restore.
	System operators, programmers, maintenance and service staff, system integrators
	None
	Generation NX, DX, YRC
	Training Academy Washington

RB2PW	Basic Programming & Welding
4.5 2–6	Intended for personnel working with a robotic welding cell. Includes all the topics covered in the Standard course. Additional arc welding content includes practical weld path programming exercises, TCP setup, weaving, welding specific robot program commands and more.
	System operators, programmers, maintenance and service staff, system integrators
	None
	Generation NX, DX, YRC
	Training Academy Washington, On-site



Advanced Training:
Want a little more?

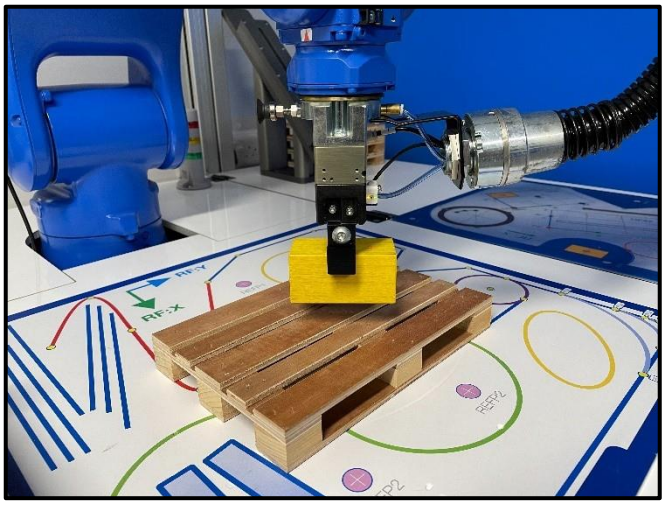
Depending on your robot application, in this section you will find time-proven standard training.
These courses will allow you to master and optimize your application.

RA3P	Advanced Programming (standard)
4.5	Program robot applications with extended instructions and functions. Setting menus and robot-specific files are explained.
2–6	
	Programmers, machine setters, system integrators
	Basic Programming (Standard) Course
	DX100, DX200, YRC1000, YRC1000micro
	Training Academy Washington

RA3CT	Advanced Programming (customized)
2	Program applications with extended instructions and functions. customized to your needs.
2–4	
	Experienced programmers and machine setters, maintenance staff and system integrators
	Basic Programming (Standard)
	DX100, DX200, YRC1000, YRC1000micro
	Training Academy Washington

RA3PH	Advanced Programming (Handling)
2	Handling application with extended instructions and functions. Use of coordinate systems, position variables, reference points, arithmetic functions, temporary shift and status variables are explained. Practical exercises for stacking/de-stacking and palletizing.
2–4	
	Experienced programmers, machine setters, system integrators
	Basic Programming (Handling) Course
	DX100, DX200, YRC1000, YRC1000micro
	Training Academy Washington

RI2GP	General Purpose User IO Integration
2	Connect your own equipment to the controller. User IO wiring connections are explained alongside practical exercises to integrate proximity sensors, switches, lamps and push buttons. The robot system Concurrent IO (CIO) is explained with practical IO signal mapping exercises.
2–4	
	Experienced programmers, system integrators
	Basic Programming Course
	DX100, DX200, YRC1000
	Training Academy Washington



Functional Safety Technology:

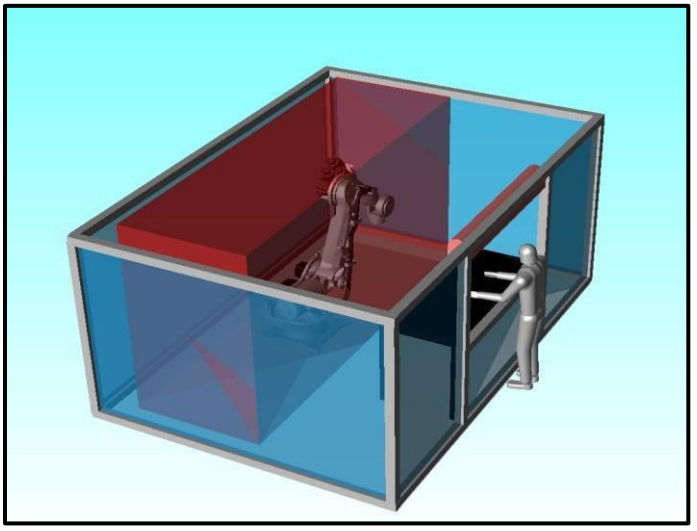
Safety first

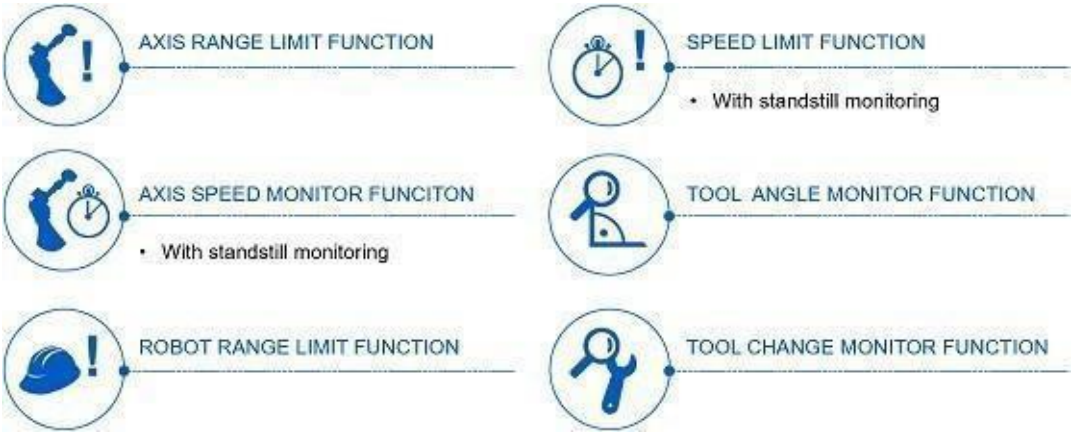
Safety is of top priority and increasingly important in the industrial sector. Finding your way through the jungle of regulations, standards and directives or applying a YASKAWA safety solution is not easy, as no mistakes are allowed.

We put you on the safe track to make sure you thoroughly understand the Functional Safety Unit.

RS4P1	Functional Safety Unit
4 2–6	Legal framework, regulations, directives and standards for a proper use and operation of safety devices. Safe Programming and Testing of the FSU.
	Programmers, System Integrators
	Basic Programming Course
	DX200, YRC1000
	Training Academy Washington

RS4P2	Functional Safety Unit (with PFL)
5 2–4	Legal framework, regulations, directives and standards for a proper use and operation of safety devices. Safe Programming and Testing of the FSU. With additional PFL (Power Force Limitation) topic, for collaborative robots.
	Programmers, System Integrators
	Basic Programming Course
	DX200, YRC1000
	Training Academy Washington





Maintenance

Keep it running like clockwork

We train you in Basic maintenance and repair skills so that your robot solution "runs like clockwork" and failures of the system – if there are any – can be eliminated as quickly as possible.

No matter whether you only carry out the "simple" daily maintenance or do the entire robot repairs yourself: we show you every lubricating nipple, every screw that you must turn or electrical contacts so that you don't get your wires crossed.

Basic Maintenance (Service)

All robot and controller generations

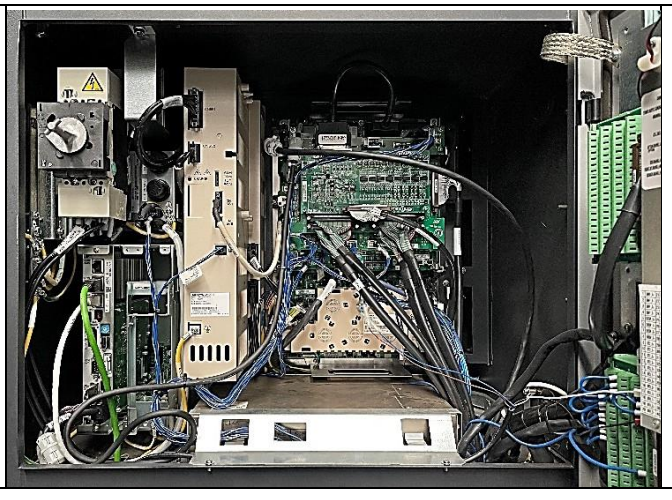
RB5M3	Basic maintenance 3 days
3 2–4	Intended for maintenance staff without prior programming experience. Operation and maintenance of industrial robots including greasing procedures, servo motor replacement, robot calibration, system data backup and more
	Maintenance and service staff, system managers
	None
	Generation NX, DX, YRC
	Training Academy Washington

Every maintenance and service technician needs this training. Only if you know how a machine works and runs correctly, you can find out why an error occurred or what is not working. Therefore, it is essential that your maintenance staff master the basics of robot operation. Only then the creation of test programs and calibration jobs will no longer be a problem. In addition, this course teaches the basics of daily maintenance, from visual inspections to "re-greasing" and battery replacement according to the maintenance schedule.

Basic Maintenance (Service)

All robot and controller generations

RB5M2	Basic maintenance 2 days
2 2–4	Intended for maintenance staff with prior programming experience. Operation and maintenance of industrial robots including greasing procedures, servo motor replacement, robot calibration, system data backup, controller circuit board identification, battery replacement and more
	Maintenance and service staff, system managers
	Basic Programming Course.
	Generation NX, DX, YRC
	Training Academy Washington



Robot Software Motosim VRC

Virtual Robot Cell

Yaskawa's high-detail simulation tool for Motoman® robots, Motosim® EG-VRC, is a PC-based software designed for accurate, offline programming of complex systems.

With an extensive model library (as well as many built-in functions) the time, risk, and expense of creating robot jobs and setting up work cell configurations is drastically reduced via the use of this user-friendly software.

It provides a way of creating a robot job while the work cell is still under construction, speeding up integration time, as the data files can be transferred once the work cell is complete.

While some basic touch-up may be required, having the robot job prepared beforehand can be a huge timesaver.

More common, perhaps, is the ability to program a robot for "part B" while "part A" is being run on the same robot. Once "part A" is complete, the files can then be downloaded to the robot controller to run "part B" when needed. Again, this saves time, facilitating quick changeover.

Powerful Simulation Software

Controlled by DX100 | Controlled by DX200 | Controlled by FS100 | Controlled by NX100 | Controlled by YRC1000

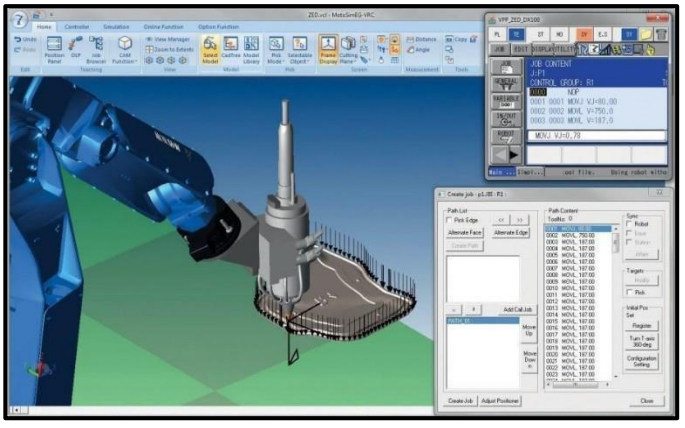
RSO12	Basic Training MotoSim
3	Fundamentals in MotoSim VRC. Integration of models, cells, and simple robot programs.
1-4	
	Experienced programmers, machine setters, system integrators, work preparation
	Basic training, PC experience and License Dongle.
	Training Academy Washington

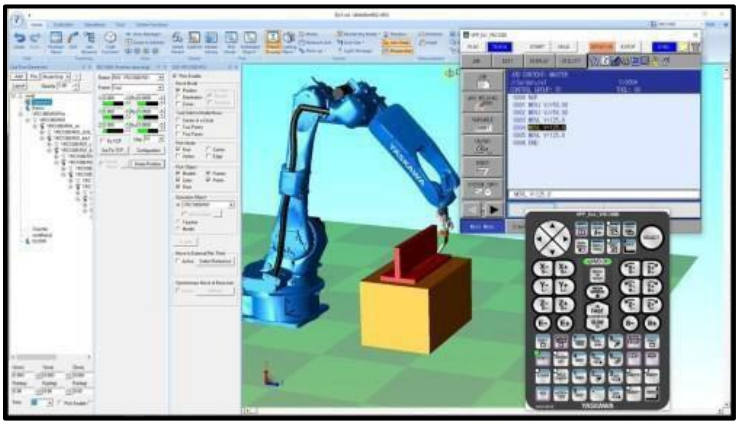
RSO13	MotoSim Module 1 – Base/External Axis
1.5	Fundamentals in MotoSim VRC. Integration of base and external axis positioners.
1-4	
	Experienced programmers, machine setters, system integrators, work preparation
	Basic training, PC experience and License Dongle.
	Training Academy Washington

Offline Programming, 3D Simulation, Virtual Robot Control

KEY BENEFITS

- Offline programming of complex systems
- Reduction of setup, non-productive and commissioning times
- Reach analysis
- Path planning
- Collision detection
- Accurate cycle time verification
- Advanced control functions and simulation of the YASKAWA product family, including robots, gantries, tracks, and positioners





How to find us...

The YASKAWA Academy is located in our purpose-built facility at Hillthorn Business Park, Infiniti Drive, Washington, NE37 3BR.

DIRECTIONS FROM JUNCTION 64, A1(M) (Northbound)

DIRECTIONS FROM JUNCTION 64, A1(M) (Northbound)

From the A1(M), At Junction 64 take the A195 exit to Washington/Birtley then:

Continue on A195 for 10 min (4.6 mi) Continue onto Western Hwy/A195

Travel 1.0 miles, then At Princess Anne Interchange, take the 2nd exit onto Northumberland Way/A195

Travel 0.5 miles, then At the roundabout, take the 2nd exit and stay on Northumberland Way/A195

Travel 0.4 miles, then At the roundabout, take the 2nd exit onto Pattinson Rd

Travel 0.3 miles, then At the roundabout, take the 2nd exit and stay on Pattinson Rd

Travel 1.2 miles, (go through 3 roundabouts) then
At the roundabout, take the 2nd exit onto Nissan Way

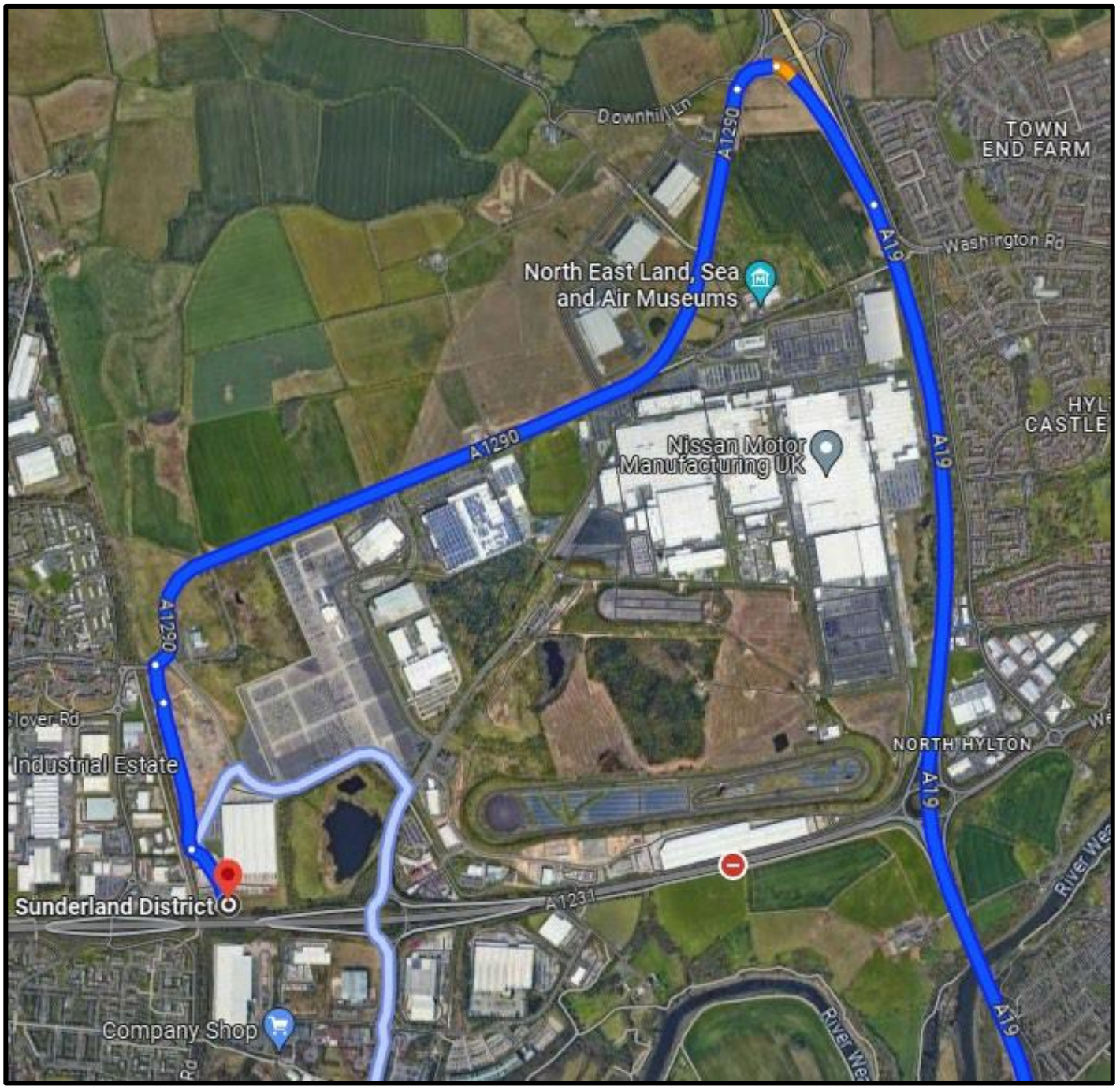
Travel 0.3 miles, then Turn left

Travel 0.4 miles, then Turn left onto Heron St

Travel 0.2 miles, then Turn left onto Infiniti Drive

Travel 0.1 miles, then Arrive at **YASKAWA Washington** on the right

DIRECTIONS FROM A19 (Northbound)



DIRECTIONS FROM A19 (Northbound)

From the A19, take the A1290 exit then:

At Downhill Ln Interchange, take the 1st exit onto Downhill Ln

Travel 0.1 miles, then **Downhill Ln turns slightly left and becomes A1290**

Travel 1.9 miles, then **Turn left**

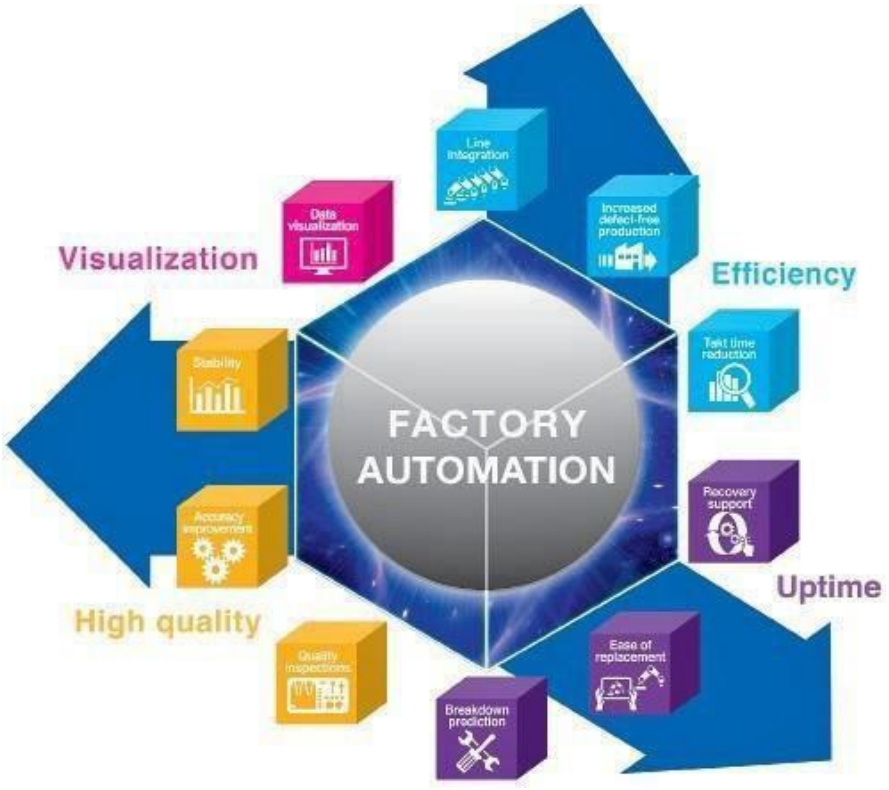
Travel 420 ft, then **Slight right**

Travel 0.3 miles, then **Slight left at Infiniti Drive**

Travel 0.1 miles, then **Arrive at YASKAWA Washington on the right**

i³-Mechatronics

INTEGRATED • INTELLIGENT • INNOVATIVE



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Training Overview
21-01-2024

YASKAWA ACADEMY