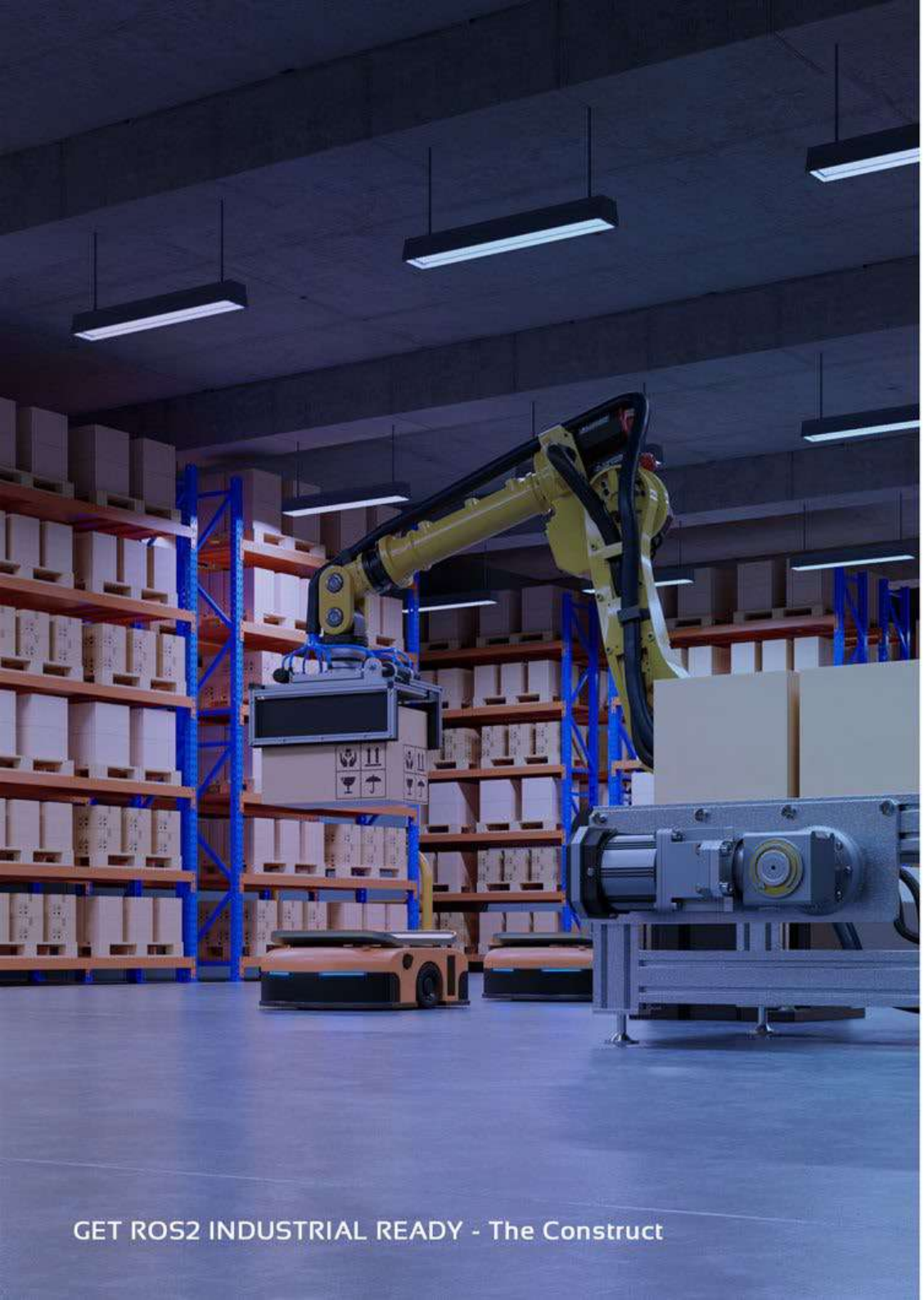

ON-SITE TRAINING
Get ROS2 Industrial Ready
September 20th - 24th, 2021 // Barcelona, Spain
ROS2 Basics + ROS2 Nav2 + Manipulation with MoveIt2
HIGHLIGHTS
The Construct
in corporation with
Robotnik




# Get ROS2 Industrial Ready

- Practice with Simulators & **Real Robots**
- **40 Hours** of Instructor-Led Hands-On Training
- **Life-time Access** to the Course Materials
- Visit Barcelona-based **Robotics Companies**
- **Lunch** and Snacks Provided
- **Certificate**

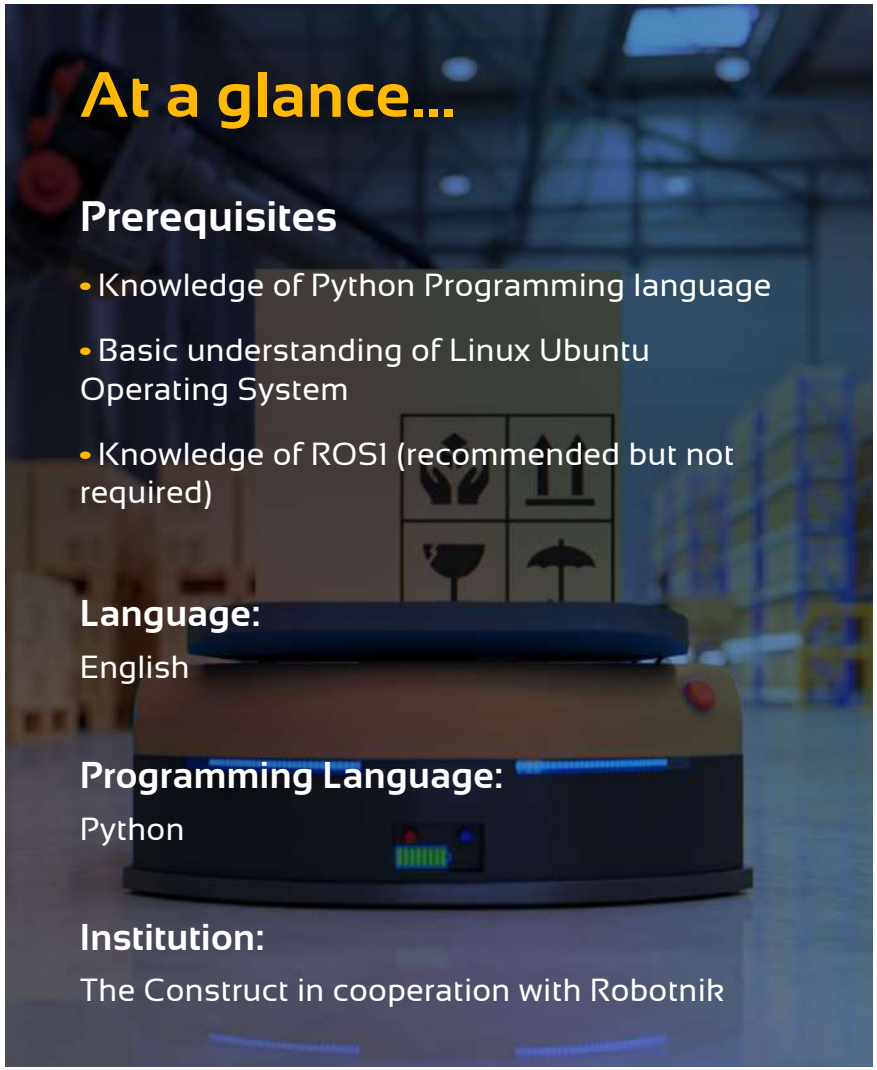
# About this workshop

Understanding how ROS2 works is becoming a MUST.

ROS2 is expected to fully replace ROS1 by 2023. The Galactic distribution released in May 2021 shows ROS2 is very mature and ready for real-world applications.

In this five-day ROS2 training, learn **how to program robots with ROS 2 Galactic**, including navigation and grasping.

Participants will practice with robot simulations and then with real robots to test their programs live.



# What you'll learn

- Creation of ROS2 packages
- Management of the new Colcon universal building system
- Topic publishers and subscribers in ROS2 Python
- Nodes management: life cycle, executors and callback groups
- Services and actions
- Hybrid application with ROS1 and ROS2
- Use of debugging tools in ROS2
- ROS2 Mapping
- ROS2 Localization
- ROS2 Path Planning
- ROS2 + DDS
- Create and configure a MoveIt2 package for a robotic arm
- Perform ROS2 Motion Planning & Grasping

## How is this workshop for?

- ROS developers that want to transition to ROS2
- Researchers focusing their research on ROS2
- Engineers or CTOs who want to build scalable robotics products, faster.

# Real Robots used

You will be using the following real robots throughout the training:


## RB-1 Base / Robotnik

Autonomous and collaborative mobile platform

The RB-1 BASE mobile robot is a robot platform designed for indoor applications. The mobile robot can carry different loads or materials and can integrate other components or platforms such as a robotic arm or a torso.

The software includes a control system, a tracking system laser-based, a navigation system and a user interface HMI (basic).

## UR3e / Universal Robots

A Flexible Collaborative Robot Arm

The UR3e collaborative robot is a smaller collaborative table-top robot, perfect for light assembly tasks and automated workbench scenarios.

The compact table-top cobot weighs only 24.3 lbs (11 kg), but has a payload of 6.6 lbs (3 kg), ±360-degree rotation on all wrist joints, and infinite rotation on the end joint.

# Training Details

## Day 1

### ROS Fundamentals

**Topic 1 - Understanding Basic ROS2 Concepts**

- Structure and launch ROS2 programs (packages & launch files)
- Create basic ROS2 programs (Python-based)
- Understand basic ROS2 concepts: Nodes, Client Libraries, etc.

**Topic 2 - ROS2 Topics**

- Topic Subscribers
- Topic Publishers
- Interfaces
- Management of nodes

**Topic 3 - ROS2 Debugging Tools**

- Use logs in ROS2
- RViz2 debugging tool
- ROS2 doctor

## Day 2

### ROS2 Advanced Topics

- ROS2 DDS
- ROS2 Services
- ROS2 Actions
- ROS1_Bridge

## Day 3

### ROS2 Nav2

- ROS2 Mapping
- ROS2 Localization
- ROS2 Path Planning and Obstacle Avoidance

## Day 4

### ROS2 Nav2 Advanced Features & Manipulation

**Topic 1 - ROS2 Nav2 Galactic Functionality**

- Waypoint Task Executors
- Speed Limited Zones
- Keep out zones

**Topic 2 - Arm Navigation with MoveIt2**

- Configure a Moveit2 package for a robotic arm
- Programatically perform motion planning

## Day 5

### Grasping

- Use perception to detect object location
- Grasp object

**5 days**

**40h total length**

# Agenda

| | Monday Sept 20th | Tuesday Sept 21st | Wednesday Sept 22nd | Thursday Sept 23rd | Friday Sept 24th |
|---|---|---|---|---|---|
| 9:00 – 11:00 a.m. | ROS2 Basics Session 1 | ROS2 Basics Session 3 | ROS2 NAV2 Session 1 | ROS2 Nav2 Session 3 | ROS2 Manipulation 2 |
| 11:00 – 11:30 a.m. | Coffee Break | Coffee Break | Coffee Break | Coffee Break | Coffee Break |
| 11:30 a.m. – 1:30 p.m. | ROS2 Basics Session 2 | ROS2 Basics Session 4 | ROS2 Nav2 Session 2 | ROS2 Manipulation 1 | ROS2 Manipulation 3 |
| 1:30 – 2:30 p.m. | Lunch Break | Lunch Break | Lunch Break | Lunch Break | Lunch Break |
| 2:30 – 6:30 p.m. | Real Robot Project | Real Robot Project | Real Robot Project | Real Robot Project | Real Robot Project |
| 7:00 – 8:00 p.m. | Visit Robotics Company | Visit Robotics Company | Visit Robotics Company | Visit Robotics Company | Go have a drink |

# Instructors

**Alberto**

Head of Education at The Construct | Creator of over 30 ROS courses | Author of ROS IN 5 DAYS book collection

**Ricardo**

CEO of The Construct | Teacher of Robotics at La Salle University and Universitat Politècnica de Catalunya

**Miguel Angel**

Head of Research at The Construct | Creator of over 10 ROS AI courses | Author of ROS IN 5 DAYS book collection

**Rodrigo**

Robotics Engineer at The Construct | Leader of RoBox - 24/7 Remote Real Robot Lab

## Testimonial

*<< Thanks for the outstanding workshop. The course was really interesting, valuable and helpful. >>*

Xue Er (Shamaine) Chung
AR/MR Robotic Research Engineer

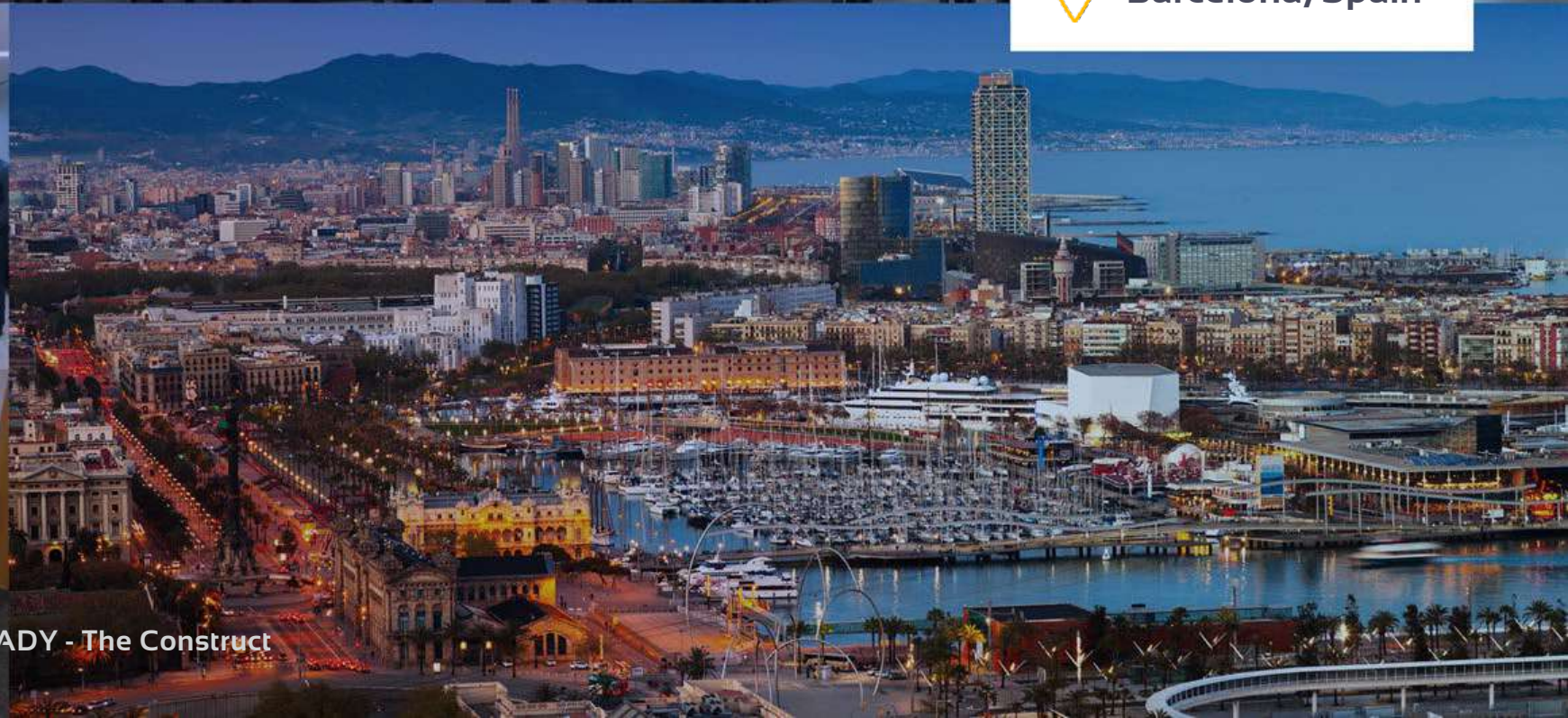
# Prices

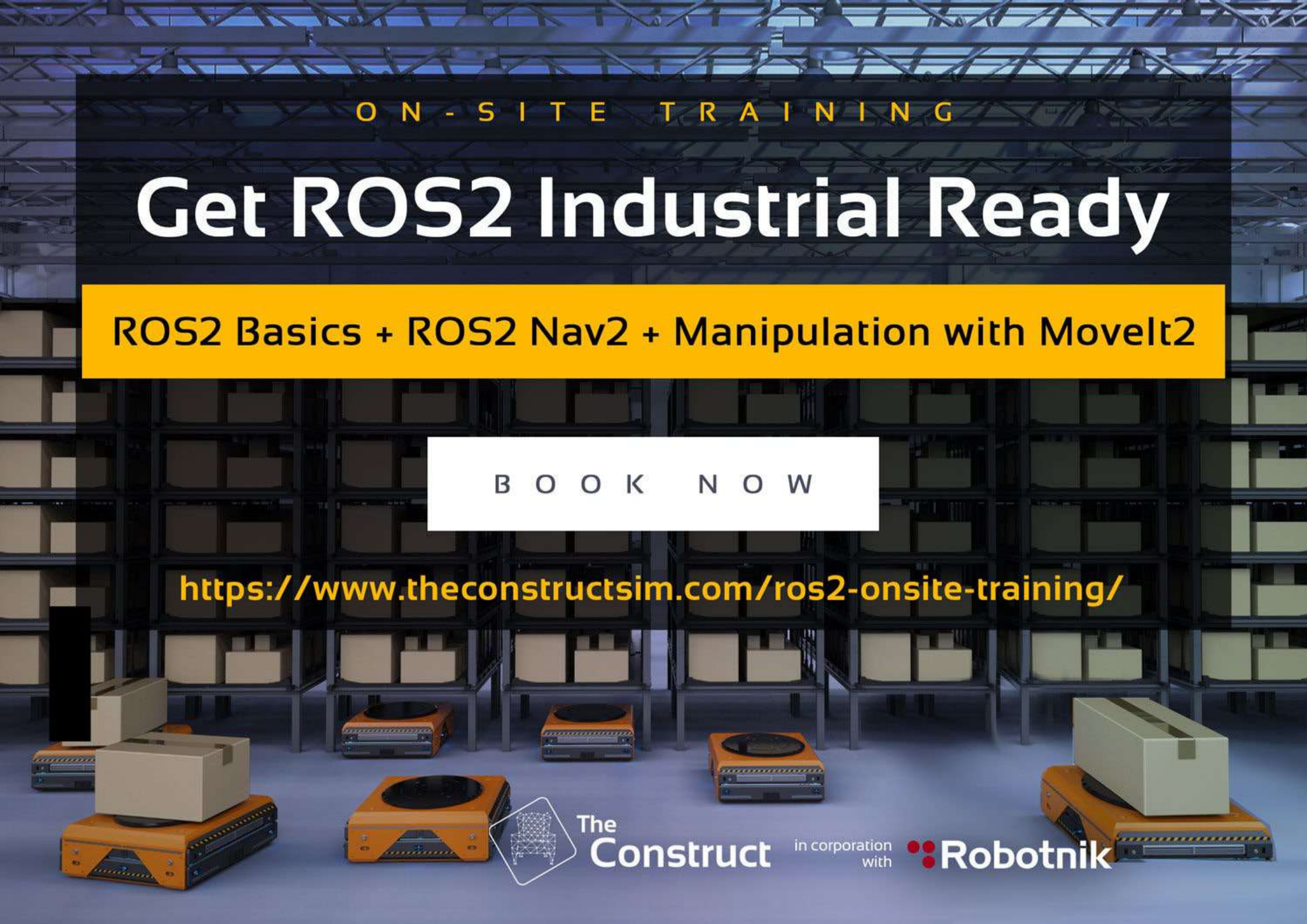
| | |
|---|---|
| ~~**Early Registration Fee**~~ (On or before August 10, 2021) | ~~€ 1800 EUR~~ |
| **Regular Registration Fee** (On or before August 30, 2021) | € 2300 EUR |
| **Late Registration Fee** (September 1, 2021 and onwards) | € 3000 EUR |

**20 spots available!**

which are served on a FIFS basis

Barcelona, Spain




ON-SITE TRAINING
Get ROS2 Industrial Ready
ROS2 Basics + ROS2 Nav2 + Manipulation with MoveIt2
BOOK NOW
https://www.theconstructsim.com/ros2-onsite-training/
The Construct
in corporation with
Robotnik