# Logistics and Warehousing for Industry 4.0

### COURSE OUTLINE

Course Name	Logistics and Warehousing for Industry 4.0
Catalogue Number	3301-0022
Category	Automation, llot, and Industry 4.0
Duration	15 Hours
Recommended Prerequisites	Advanced Robotic Programming

#### 1. Introduction to Supply Chains

Course Introduction What are Supply Chains? Supply Chain Logistics The Value Chain The Digital Supply Chain Supply Chain Management and No-Touch SCM

#### 2. Warehouses in Modern Industry

Types of Warehouses Components and Characteristics of Warehouses Storage Methods Inventory Rotation and FIFO Industry 4.0 Warehouses – An Overview

#### 3. Automatic Storage and Retrieval

- The Structure and Function of ASRS Systems
- How an ASRS Works
- Inventory Management
- The Intelitek ASRS-36u

#### Lab Activity 3A: Programming the ASRS-36u

# intelitek >> \*

## INDUSTRY 4,\$

#### 4. Logistics Tracking

Tracking in Logistics 4.0 and its Benefits Tracking Along the Supply Chain Logistics 4.0 Tracking Technologies: RFID, Barcode, IoT, and GPS

#### Lab Activity 4A: The RFID Reader

#### Lab Activity 4B: RFID and the ASRS

#### 5. How AMRs Work

What are AMRs and AGVs? Comparing AMRs and AGVs AMR Operation AMR Systems Mapping, Localization, and Pathfinding AMRs in Warehouses

#### Lab Activity 5A: MiR Academy Training

Lab Activity 5B: Connecting to the AMR

Lab Activity 5C: Mapping Your Facility

Lab Activity 5D: Positions, Markers, and Zones

#### Lab Activity 5E: Programming Missions

#### 6. Robotic Arms in Warehousing and Logistics

What are Robotic Arms? Robotic Arms in Warehousing and Logistics Applications Case Studies

#### 7. Cobots

What are Cobots?

Comparing Cobots and Conventional Industrial Robotic Arms

**Cobot Programming** 

Cobots in Industry 4.0

Levels of Cooperation

Cobots in Logistics

#### Lab Activity 7A: Cobot Pick and Place

# intelitek >> \*

## INDUSTRY 4,

#### 8. Sensors in Warehouses

**Defining Sensors** 

Types of Warehouse Sensors

Applications for Sensors in Warehouses

Sensors for Inventory Management

Machine Vision Sensors and Robot Guidance

#### Lab Activity 8A: Machine Vision Guidance and the Cobot

#### 9. Safety in the Smart Warehouse

Warehouse Hazards and the Importance of Safety General Warehouse Safety Guidelines Employee Responsibilities Industry 4.0 Technologies and Warehouse Safety Laser Safety Scanners

#### Lab Activity 9A: The Safety Scanner

#### **10. IIoT in the Smart Warehouse**

Connectivity and Communication Communication Protocols for Logistics IIoT Smart Sensors and IO-Link Cloud Monitoring and Supervision Alarms and Ticketing

#### 11. Logistics 4.0 Software: Part 1

- Software for Industry 4.0
- Considerations
- SCM Software
- WMS Software

#### 12. Logistics 4.0 Software: Part 2

APS Software ERP Software BI Software MES Software Introducing OpenMES OpenMES and the Smart Logistics System



## INDUSTRY 4.

#### 13. Managing a Smart Warehouse

- Logistics Planning Procurement Measuring Performance Risk and Security Management Labor Management Upgrading to a Smart Warehouse Smart Industry Readiness Index (SIRI)
- ( Important Note: This outline is subject to change.