Software Technologies for Industry 4.0

COURSE OUTLINE

Catalogue Number	3301-0018
Category	Industry 4.0
Duration	15 Hours
Prerequisites	Level 1 Industry 4.0 Courses

Activity 1: Software Technology Overview

- Hardware vs Software
- Why Go Digital?
- Overview of Software Technologies in Modern Industry

Activity 2: APS

- Defining Supply Chain Management
- Lean Manufacturing
- APS Software Features
- APS Vendors

Activity 3: MES

- Total Quality Management
- How MESs Help Manufacturers
- MES Core Functions
- MES Examples
- Intelitek's OpenMES

Activity 4: ERP

- Problems with the Silo Structure
- Enterprise-Wide Integration
- ERP Systems and Their Functions
- ERP and MES
- Modular ERP Solutions

Activity 5: Scheduling Software

- The Need for Scheduling Software
- Production Scheduling Challenges

- Benefits of Production Scheduling Software
- Production Scheduling Software Systems

Activity 6: Cryptography

- CAD Software Functions
- CAM Software
- Computer Numerical Control
- CAD/CAM Toolpaths
- Computer Integrated Manufacturing

Activity 7: System Visualization Tools for VR

- Virtual Reality: Definitions and Examples
- The Three I's of VR
- Spectrum of Visual Technologies
- VR Use Cases

Activity 8: System Visualization Tools for AR

- Augmented Reality: Definitions and Examples
- Applications of AR
- AR Hardware and Software
- AR Industry 4.0 Applications

Activity 9: System Visualization Tools for Digital Twinning

- The Digital Twin
- Why Use Digital Twins?
- Components of a Digital Twin
- Types of Digital Twins
- Benefits of Digital Twin Technology

Activity 10: Quality Control Software

- Key Functionalities of Quality Control Software
- Quality Software Maturity Ladder
- Software Packages for Each Maturity Level
- Quality by Design
- Design of Experiments

Activity 11: Artificial Intelligence Software – Part 1

- Defining AI
- Types of AI
- Data Complexity and Data Uncertainty
- Challenges in AI
- Machine Learning Software

Activity 12: Artificial Intelligence Software – Part 2

- AI and Manufacturing
- Supervised and Unsupervised Machine Learning
- Neural Networks: Advantages and Disadvantages
- Neural Networks: Use Cases

Activity 13: Business Intelligence Tools

- Defining BI
- Business Intelligence vs Business Analytics
- Key Components of BI Software
- BI and Data Warehousing
- BI Software Packages

Activity 14: Data Modeling Software

- Defining Data Modeling
- The Data Modeling Process
- ERD and UML
- Data Modeling Approaches
- Data Modeling Software Packages