KUKA Robotics Training Concept

- High Quality Robot Training tailored to the customer's needs
- Challenges to Robot Training
Many Different Applications …
... in Numerous Industries

Wood & Furniture  Building Materials  Metal  Foundry  Plastics  Food

Aircraft & Space Industries  Medical Technology  Automotive  Pharmaceutical & Chemical Industry  Printing & Paper  Injection Molding


and many more...
3 Main Training Types

- Technical product training
  - General robot operation and programming training
  - Electrical and mechanical servicing training
  - Commissioning of fieldbus and other communication systems
  - Commissioning of external axis and other supplementary hard- and software

- Application training
  - Arc Welding with robots (no basic arc welding training)
  - Dispensing (no basic dispensing training)

- Generalized robot training
  - Broad knowledge for robot cell designers
  - Safety topics around robot cells
- Target Audience and Training Types
Target Audience

- Robot operators and production personnel
- Shift-foremen and system supervisors
- Robot programmers
- Start-up engineers and system programmers
- Maintenance personnel (electrical + mechanical)
- Planners and project planners
- Managers
Production Personnel and Set-Up Men/ Shift-Foremen

- **Robot Operation 1**
  - 2 days
  - No special requirements

- **Robot Operation PRO**
  - 4 days
  - Min. 3 Years of relevant vocational experience

- **Robot Operation KUKA.ArcTech**
  - 5 days
  - Experience in arc welding required

- **Tasks:**
  - Running production systems
  - Adapting existing robot programs
  - Safety: working safely with robots in production

- **Safety topics**
- Hand jogging the robot
- Selecting programs
- Starting and restarting programs

- **Additionally to „Robot Operation 1“:**
  - Adapting programs to changing parts
  - New programs based on existing ones

- „Robot Operation PRO“ focused on arc welding

Prerequisites: 9 yrs. school education
Robot and System Programmer and Start-Up Engineers

Min. 3 years of relevant vocational training

Robot Programming 1
KUKA System Software
5 days

Robot Programming 2
KUKA System Software
5 days

Robot programming
- Teach-In mode
- High-level language

Commissioning and Configuration of KUKA.VisionTech

Fieldbus Technology *
- KUKA.SafeOperation
- Commissioning and Configuration of RoboTeam
- Commissioning and Configuration of KUKA.mxAutomation
- Commissioning and Configuration of KUKA.ConveyorTech

Communication between robot system and periphery of production cell.

Configuration of interfaces
2-5 days each

Commissioning and Programming of KUKA.VisionTech
Commissioning and Configuration of External Axes
Commissioning and Programming of KUKA.RSI
Further Technologies
Robot and System Programmer and Start-Up Engineers (detail)

- Min. 3 years of relevant vocational training

**Robot Programming 1**
- KUKA System Software
- 5 days
- Safety topics
- Hand jogging of the robot
- Tool calibration and mastering
- Programming in Teach-In mode
- Working with variables

**Robot Programming 2**
- KUKA System Software
- 5 days
- Safety topics
- Programming in KRL (KUKA Robot Language)
- Complex data types
- Branch and switch instructions
- Calculated positions
- KUKA IDE (Integrated Development Environment)
Maintenance and Repair Electrical

- **Prerequisites**: Electrically skilled person
- **Tasks**: fault location in complex systems, exchanging parts
- **Safety**: working safely with high voltage/currents

- **Min. 3 years of relevant vocational training**
- **Prerequisite**: Electrically skilled person

- **Robot Operation PRO OR Robot Programming 1**
- **Electrical Servicing KR C4 – System Technology 4 days**

- **Safety topics**
- **KUKA controller functionality**
- **Fault diagnosis**
- **Maintenance and repair**
Maintenance and Repair Mechanical

- Min. 3 years of relevant vocational training

- Mechanical Servicing Product Family
  - KR AGILUS

- Mechanical Servicing Product Family

- Mechanical Servicing Product Family
  - KR 30-3 and KR 60-3

- Mechanical Servicing Product Family
  - QUANTEC

- Mechanical Servicing Product Family
  - Series 2000

- Mechanical Servicing Product Family
  - KR 1000 Titan

- Mechanical Maintenance and Repair (different robot families)
  - 2-4 days each

- Prerequisite: Basic mechanical training
- Tasks: fault location, exchanging parts
- Safety: working safely with heavy parts
Planners, Project Planners and Robot Cell Designer

- Technical training required

- Robot Selection & Integration
  - 4 days
  - Criteria for robot selection
  - Interfaces
  - Solutions

- Safety for KUKA Robot Cells
  - 2 days
  - Safety norms and standards (requirements)
  - Possible solutions

- KUKA.SIM
  - 4 days
  - Robot cell simulation
  - Offline programming
**LBR iiwa courses**

- Basic knowledge in object oriented programming would be helpful (JAVA-Technologie)
- Min. 3 years of relevant vocational training

- Commissioning and Programming LBR iiwa
  - 10 days

- LBR iiwa – Advanced Sensitivity Programming for Industrial Applications
  - 4 days

- LBR iiwa - Safety-Start-Up and HRC-Programming
  - 4 days

- FBT ProfiNet for KSS 8.x u. KUKA.Sunrise OS
  - 2 days

- Programming KUKA Sunrise Connectivity
  - 1 day

- Robot Operation LBR iiwa
  - 2 days

- Operator

- Min. 3 years of relevant vocational training
- Prerequisite: Electrically skilled person

- Maintenance Personnel

- Electrical Servicing KUKA Sunrise Cabinet
  - 4 days

- Operator

- Min. 3 years of relevant vocational training

- Min. 3 years of relevant vocational training

- Prerequisite: Electrically skilled person
The Future of Robot Training

- Using robots will become easier for the enduser
- Training focus will be on applications and processes

- Automatised production cells will become more and more productive and complex
- Planning, commissioning and initially programming of the employed robots and systems will become more complex and challenging (high qualification necessary: programming, mechatronics)
Thank you for your attention!