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Chapter 1 — Introduction to the Industrial Robotics World

pp. 1–34

This chapter introduces industrial robotics, robotic manufacturing cells, industrial robot applications, robot programming concepts, industrial equipment and the role of robotics in modern manufacturing.

Chapter 2 — Robot Manipulators and Control Systems

pp. 35–107

Main topics include:

- Industrial robot manipulators
- Robot structure and components
- Coordinate systems
- Robot kinematics
- Forward kinematics
- Inverse kinematics
- Jacobian
- Robot dynamics
- Motion and trajectory generation
- Robot control systems
- Robot controllers
- Robot programming
- Industrial robot programming environments
- Practical robot programming examples

The book specifically develops practical **kinematic and dynamic modelling and computation** for industrial manipulators.

Chapter 3 — Software Interfaces

pp. 109–171

Main topics include:

- Software architecture for industrial robotics
- Robot/computer interfaces
- Programming interfaces
- Communication between computers and robot controllers
- Client-server architectures
- TCP/IP communication
- Ethernet
- Remote procedure calls
- ActiveX
- OPC
- MATLAB interfaces
- Robot control and monitoring software
- Distributed robotic manufacturing cells

Chapter 4 — Interface Devices and Systems

pp. 173–223

Main topics include:

- Human-machine interfaces
- Input devices
- Sensors
- Digital and analogue signals
- Industrial communication systems
- Fieldbus systems
- PROFIBUS
- DeviceNet
- Computer interfaces
- Vision systems
- Speech recognition
- Operator interfaces
- Robot supervision and monitoring
- Integration of interface devices with robotic systems

Chapter 5 — Industrial Manufacturing Systems

pp. 225–266

Main topics include:

- Robotic manufacturing cells
- Manufacturing systems
- Integration of industrial robots
- Conveyors and material handling
- Robot-based production systems
- Palletizing
- Robotic welding
- Production tasks
- Cell supervision

- Communication between manufacturing equipment
- Examples of integrated industrial robotic applications

The book's stated focus is specifically on **designing and building robotic manufacturing cells** and on real-world laboratory applications.

Chapter 6 — Final Notes

pp. 267–280

- Conclusions
- Final considerations
- Perspectives for industrial robotics and future manufacturing systems

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