Introduction to Advanced Manufacturing for Industry 4.0

Catalogue Number	77-3301-0014
Category	Industry 4.0
Duration	15 Hours

1. (Core): Introduction

- Definition of Manufacturing
- The History of Manufacturing
- Manufacturing and the Economy
- The Spectrum of Manufacturing
- Project Production
- Job Shop Production
- Mass Production
- Process Production
- Process Selection
- Section 1 Review

2. (Core): Careers in Manufacturing

- The Changing Face of Manufacturing Employment
- Career Choice Considerations
- Common Manufacturing Jobs
- Finding Career Information
- Assembly Workers
- Manual Machine Operators
- CNC Machine Operators
- First-Line Supervisors
- Production Planners
- Transportation Manager
- Quality Control Technicians
- Industrial Engineers
- Factory Managers
- Section 2 Review

3. (Activity): Seeking a Manufacturing Career

- 3F (Activity): seeking a Manufacturing Career – Fundamental
- Introduction
- Job Search
- Resume Preparation
- Conclusion
- 3A (Activity): Seeking a Manufacturing Career – Advanced
- Introduction
- Job Search
- Resume Preparation
- Writing a Cover Letter
- Conclusion

4. (Core): The Manufacturing Company

- Types of Manufacturing Companies
- Departments in a Manufacturing Company
- Manufacturing as a Competitive Advantage
- Manufacturing in the Design Process
- Manufacturing Integration Strategies
- Big Data Analytics and Industry 4.0
- Section 4 Review

5. (Activity): Planning and Staffing a Manufacturing Company

- Introduction
- Product Selection
- Integration Strategy Selection
- Process Model Selection
- Department Planning
- Staff Planning
- Conclusion

6A. (Core): Manufacturing Processes – Part I

- Introduction
- Materials
- Types of Processes
- Selecting a Manufacturing Process
- Sheet Metal Processes
- Other Metal Processes

6B. (Core): Manufacturing Processes – Part II

- Plastic Processes
- Chemical Processes
- Textile Processes
- Food Processes
- Packaging
- Packaging and Storage Specifications
- Packaging Laws and Regulations
- Labeling
- Shipping Documentation
- Section 6 Review

7A. (Core): Computers in Manufacturing – Part I

- Introduction
- Computers in the Design-Production Process
- CAD
- CAE
- CAM
- CNC

7B. (Core): Computers in Manufacturing – Part II

- Introduction
- Statistical Process Control
- Computers in Manufacturing Company Management
- Forecasting Software

- Computer Simulation Modeling
- Computers in Factory Control
- Section 7 Review

8A. (Core): Automation in Manufacturing – Part I

- Introduction
- Advantages and Disadvantages of Automation
- Components of Automation
- CNC Machines
- Robots
- Conveyors
- AVGs
- AS/RS
- Cyber-Physical Systems
- Datafication

8B. (Core): Automation in Manufacturing – Part II

- Machine Vision Systems
- PLCs
- HMIs
- Types of Automation
- Motion Control
- Flexible Manufacturing Systems
- Computer Integrated Manufacturing
- Implementing an Automated System
- ICS Technologies
- SCADA

9. (Project): The Arrow Plane

- 9F (Project): The Arrow Plane – Fundamental
- Introduction
- Materials and Assembly
- Quality Control
- Filling the Order
- Conclusion

9A (Project): The Arrow Plane – Advanced

Materials and Assembly

Quality Control

Manufacturing Considerations

Filling the Order

Conclusion