BOARD INFINITY

Key Industry 4.0 Technologies in Manufacturing - 1

This course is part of **Advances in Manufacturing Technology Specialization**

Instructor: **Board Infinity**

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Starts Dec 2

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4 modules
Gain insight into a topic and learn the fundamentals.

Intermediate level
Recommended experience ⓘ

2 weeks to complete
at 10 hours a week

Flexible schedule
Learn at your own pace

What you'll learn

✓ Identify key Industry 4.0 technologies and explain their roles in modern manufacturing

✓ Utilize knowledge of Industry 4.0 technologies to optimize performance, enhance production processes, and drive innovation.

✓ Describe how these technologies collaborate to create smart factories and optimize manufacturing processes.

Skills you'll gain

Emerging Technologies · Interoperability · Innovation · Internet Of Things · Manufacturing and Production · Real Time Data · Robotic Process Automation · Computer-Aided Design · Simulation and Simulation Software · 3D Modeling · Automation · Digital Transformation · Manufacturing Processes · View less skills

Details to know
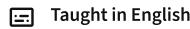
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Taught in English

Assessments
19 assignments

See how employees at top companies are mastering in-demand skills

PETROBRAS TATA DANONE Capgemini P&G L'ORÉAL

Build your subject-matter expertise

This course is part of the **Advances in Manufacturing Technology Specialization**
When you enroll in this course, you'll also be enrolled in this Specialization.

- Learn new concepts from industry experts
- Gain a foundational understanding of a subject or tool
- Develop job-relevant skills with hands-on projects
- Earn a shareable career certificate

There are 4 modules in this course

Course Description:

This course provides a comprehensive introduction to the key technologies driving Industry 4.0 in the manufacturing sector. It covers digital manufacturing, the Internet of Things (IoT), digital twins, additive manufacturing, and robotics. Learners will gain a deep understanding of how these technologies interact to create smart factories, improve production processes, and drive innovation. Through theoretical learning and practical case studies, learners will acquire essential skills for implementing and leveraging Industry 4.0 technologies in manufacturing.

Benefits:

1. Holistic Knowledge of Industry 4.0 Technologies:

Gain a comprehensive understanding of key Industry 4.0 technologies, including digital manufacturing, IoT, digital twins, additive manufacturing, and robotics, and how they transform manufacturing processes.

2. Hands-on Implementation Skills:

Develop practical skills for effectively implementing and integrating advanced manufacturing technologies through detailed modules and real-world case studies.

3. Enhanced Innovation and Efficiency:

Equip yourself with the knowledge to drive innovation, improve production efficiency, and maintain a competitive edge in the manufacturing industry by staying updated on the latest trends and best practices.

Target Audience:

This course is designed for manufacturing engineers, production managers, industrial engineers, and anyone interested in understanding and implementing Industry 4.0 technologies. It is suitable for beginners as well as professionals seeking to enhance their knowledge and practical skills in modern manufacturing technologies.

Note: This is the 2nd course of the specialization- "Advances in Manufacturing Technology"

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Read less

Digital Manufacturing

Module 1 • 5 hours to complete

This module explores digital manufacturing, a cornerstone of Industry 4.0. Participants learn fundamental concepts, examine CAD, CAM, and CIM integration, and explore the relationship between digital manufacturing and smart factories. They also discuss implementation strategies and future trends. Through engaging video lectures, participants gain essential knowledge for leveraging digital manufacturing technologies effectively.

What's included

▶ 19 videos   📖 5 readings   📄 5 assignments   💬 1 discussion prompt

Hide info about module content ⌃

▶ **19 videos • Total 85 minutes**

Introduction to the Course
-
2 minutes

Meet your Instructor
-
0 minutes

What is Digital Manufacturing: Overview
-
1 minute

Introduction to Digital Manufacturing
-
6 minutes

Key Concepts and Principles
-
5 minutes

Case Studies of Digital Manufacturing Implementation
-
5 minutes

CAM, CAD and CIM in Industry: Overview
-
1 minute

Understanding Computer-Aided Design (CAD)
-
4 minutes

Computer-Aided Manufacturing (CAM) Techniques
-
4 minutes

Computer-Integrated Manufacturing (CIM) Systems
-
6 minutes

CAM, CAD, and CIM Integration in Industry
-
3 minutes

Relationship between Digital Manufacturing and Smart Factories: Overview
-
1 minute

Overview of Smart Factory Concepts
-
5 minutes

Integration of Digital Manufacturing in Smart Factories
-
6 minutes

Benefits and Challenges of Smart Manufacturing
-
7 minutes

Implementation and Impact of Digital Manufacturing: Overview
-
0 minutes

Strategies for Implementing Digital Manufacturing

•

9 minutes

Assessing the Impact on Production Processes

•

5 minutes

Future Trends in Digital Manufacturing

•

6 minutes

📖 **5 readings** • **Total 75 minutes**

Syllabus

•

15 minutes

Read More About The Digital Manufacturing Revolution: Concepts and Case Studies

•

15 minutes

Read More About Appications of CAM, CAD, CIM

•

15 minutes

Read More About Transforming Industry with Smart Factory Solutions

•

15 minutes

Read More About Manufacturing Trends and Strategies for 2024

•

15 minutes

📋 **5 assignments** • **Total 180 minutes**

Quiz: Digital Manufacturing

•

60 minutes

Quiz: What is Digital Manufacturing

•

30 minutes

Quiz: CAM, CAD and CIM in Industry

•

30 minutes

Quiz: Relationship between Digital Manufacturing and Smart Factories

•

30 minutes

Quiz: Implementation and Impact of Digital Manufacturing

•

30 minutes

💬 **1 discussion prompt** • **Total 10 minutes**

Meet and Greet

•

10 minutes

IoT and Digital Twins

Module 2 • 5 hours to complete

Module details ⌃

This module delves into the Internet of Things (IoT) and digital twins, integral components of Industry 4.0. Participants explore IoT technology fundamentals, applications in manufacturing, and connectivity standards. They also examine the IoT value stack, covering layers such as physical elements, sensors, connectivity, analytics, and digital services. Additionally, participants learn about digital twins, their creation, management, and real-world applications. The module concludes with discussions on IoT business models, opportunities, and best practices for implementation. Through dynamic video lectures, participants gain actionable insights to leverage IoT and digital twin technologies effectively in manufacturing environments.

What's included

▶ 18 videos   📖 4 readings   📋 5 assignments

Hide info about module content ⌃

▶ **18 videos** • **Total 82 minutes**

Introduction to Internet of Things (IoT): Overview
•
0 minutes

Fundamentals of IoT Technology
•
4 minutes

IoT Applications in Manufacturing
•
9 minutes

IoT Connectivity Protocols and Standards
•
6 minutes

Design Thinking and IoT
•
5 minutes

Understanding the IoT Value Stack: Overview
•
1 minute

Value Creation Layers of the IoT Value Stack
•
5 minutes

Physical Element and Sensors
•
4 minutes

Connectivity and Analytics
•
6 minutes

Understanding the Final Layer - Digital Services
•
4 minutes

What is Digital Twin?: Overview
•
1 minute

Exploring the Concept of Digital Twin
•
4 minutes

Creating and Managing Digital Twins
•
5 minutes

Real-world Applications of Digital Twin Technology
•
6 minutes

Best Practices and Implementation of IoT and Digital Twin: Overview
•
1 minute

Business Model Patterns and IoT
•
4 minutes

Understanding the IoT Business Opportunities
•
6 minutes

Best Practices for IoT Implementation
•
4 minutes

📖 **4 readings** • **Total 60 minutes**

Read More About IoT and Manufacturing: Key Insights and Protocols for the Modern Era

•

15 minutes

Read More About Exploring the IoT Technology Stack and Architecture

•

15 minutes

Read More About Key Features and Implementation Strategies of Digital Twin

•

15 minutes

Read More About Enhancing Business Value with IoT and Digital Twins

•

15 minutes

📋 **5 assignments • Total 180 minutes**

Quiz: IoT and Digital Twins

•

60 minutes

Quiz: Introduction to Internet of Things (IoT)

•

30 minutes

Quiz: Understanding the IoT Value Stack

•

30 minutes

Quiz: What is Digital Twin?

•

30 minutes

Quiz: Best Practices and Implementation of IoT and Digital Twin

•

30 minutes

Additive Manufacturing

Module 3 • 6 hours to complete

Module details ⌃

This module introduces additive manufacturing, exploring its technologies, processes, and applications. Participants learn about various additive manufacturing techniques, industry standards, and future developments. Through engaging video lectures, they discover real-world applications and potential across different sectors.

What's included

▶ 17 videos   📖 4 readings   📋 5 assignments

Hide info about module content ⌃

▶ **17 videos • Total 82 minutes**

Introduction to Additive Manufacturing: Overview

•

0 minutes

Overview of Additive Manufacturing Technologies

•

4 minutes

Types of Additive Manufacturing

•

6 minutes

Benefits and Limitations of Additive Manufacturing

•

9 minutes

Additive Manufacturing Processes and Standards: Overview

•

1 minute

How does Additive Manufacturing Work

•

4 minutes

Understanding the AM Processes
-

4 minutes

State of current Additive Manufacturing processes
-

5 minutes

Important Standards in Additive Manufacturing
-

6 minutes

Additive Manufacturing Technologies: Overview
-

1 minute

Current state of AM Technologies
-

7 minutes

Understanding 3D Printing
-

6 minutes

Future Developments in Additive Manufacturing
-

6 minutes

Use cases of Additive Manufacturing: Overview
-

1 minute

Industry Applications of Additive Manufacturing
-

4 minutes

Case Studies of Successful Additive Manufacturing Projects
-

5 minutes

Exploring the Potential of Additive Manufacturing in Various Sectors
-

6 minutes

📖 **4 readings • Total 120 minutes**

Read More About Introduction to Additive Manufacturing: Processes, Applications, and Benefits
-

30 minutes

Read More About Exploring the Workflow, Current State, and Standards in Additive Manufacturing
-

30 minutes

Read More About Understanding the Evolution of Additive Manufacturing
-

30 minutes

Read More About Innovative Applications and Impact of Additive Manufacturing
-

30 minutes

📋 **5 assignments • Total 180 minutes**

Quiz: Additive Manufacturing
-

60 minutes

Quiz: Introduction to Additive Manufacturing
-

30 minutes

Quiz: Additive Manufacturing Processes and Standards
-

30 minutes

Quiz: Additive Manufacturing Technologies

-
30 minutes

Quiz: Use cases of Additive Manufacturing
-
30 minutes

Robotics and Autonomous Systems

Module 4 • 5 hours to complete

This module explores robotics and autonomous systems in manufacturing. Participants learn about industrial robot types, autonomous systems, and robotic process automation (RPA). Through concise video lectures, they gain insights into classifications, applications, and successful case studies, enhancing their understanding of these technologies' roles in modern manufacturing.

What's included

▶ 13 videos   📖 3 readings   📄 4 assignments

Hide info about module content ⌃

▶ **13 videos • Total 63 minutes**

Types of Industrial Robots: Overview
-
1 minute

Introduction to Industrial Robots
-
8 minutes

Classification and Applications of Industrial Robots
-
9 minutes

Challenges and Future Trends in Industrial Robotics
-
7 minutes

What are Autonomous Systems?: Overview
-
0 minutes

Introduction to Autonomous Systems
-
5 minutes

Autonomous v/s Semi Autonomous Systems
-
5 minutes

Examples of Autonomous Systems
-
4 minutes

Introduction to RPA (Robotic Process Automation): Overview
-
1 minute

What is Robotic Process Automation (RPA)?
-
5 minutes

RPA Implementation and Integration in Manufacturing
-
8 minutes

Case Studies and Success Stories of RPA Adoption in Manufacturing
-
5 minutes

Course Closure - Gratitude !
-
1 minute

📖 **3 readings • Total 90 minutes**

Read More About Key Concepts and Benefits of Industrial Robotics

Module details ⌃

- 30 minutes

Read More About Economic Impact of Robotics & Autonomous Systems
- 30 minutes

Read More About Effective RPA Use Cases in Manufacturing
- 30 minutes

📋 **4 assignments • Total 150 minutes**

Quiz: Robotics and Autonomous Systems
- 60 minutes

Quiz: Types of Industrial Robots
- 30 minutes

Quiz: What are Autonomous Systems?
- 30 minutes

Quiz: Introduction to RPA (Robotic Process Automation)
- 30 minutes

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Frequently asked questions

˄ **When will I have access to the lectures and assignments?**

To access the course materials, assignments and to earn a Certificate, you will need to purchase the Certificate experience when you enroll in a course. You can try a Free Trial instead, or apply for Financial Aid. The course may offer 'Full Course, No Certificate' instead. This option lets you see all course materials, submit required assessments, and get a final grade. This also means that you will not be able to purchase a Certificate experience.

˄ **What will I get if I subscribe to this Specialization?**

When you enroll in the course, you get access to all of the courses in the Specialization, and you earn a certificate when you complete the work. Your electronic Certificate will be added to your Accomplishments page - from there, you can print your Certificate or add it to your LinkedIn profile.

˄ **Is financial aid available?**

Yes. In select learning programs, you can apply for financial aid or a scholarship if you can't afford the enrollment fee. If fin aid or scholarship is available for your learning program selection, you'll find a link to apply on the description page.

More questions

⊙ **Visit the learner help center**

Financial aid available, learn more

Skills	Certificates & Programs	Industries & Careers	Career Resources
Artificial Intelligence (AI)	Google Cybersecurity Certificate	Business	Career Aptitude Test
Cybersecurity	Google Data Analytics Certificate	Computer Science	Examples of Strengths and Weaknesses for Job Interviews
Data Analytics	Google IT Support Certificate	Data Science	High-Income Skills to Learn
Digital Marketing	Google Project Management Certificate	Education & Teaching	How Does Cryptocurrency Work?
English Speaking	Google UX Design Certificate	Engineering	How to Highlight Duplicates in Google Sheets
Generative AI (GenAI)	IBM Data Analyst Certificate	Finance	How to Learn Artificial Intelligence
Microsoft Excel	IBM Data Science Certificate	Healthcare	Popular Cybersecurity Certifications
Microsoft Power BI	Machine Learning Certificate	Human Resources (HR)	Preparing for the PMP Certification
Project Management	Microsoft Power BI Data Analyst Certificate	Information Technology (IT)	Signs You Will Get the Job After an Interview
Python	UI / UX Design Certificate	Marketing	What Is Artificial Intelligence?

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