Presentations on digital factory

- Groups of 2
- Presentation about 10 - 15 Minutes
- Due date tbd
- Topic:
  - Choose own topic or from list below
  - Elaborate usage, techniques
  - Describe example usage in industry OR
  - present some of the latest research trends
  - consider the additional points listed below

1. The Role of Digital Twins in the Modern Factory

- Explore how digital twins can be developed and maintained
- Discuss their impact on product design, maintenance, and production.

2. Product Lifecycle Management (PLM) in Smart Manufacturing

- Research how PLM manages a product from inception to disposal.
- Highlight real-world examples of PLM implementations.

3. Automation and Robotics in the Digital Factory

- Investigate the use of advanced robotics and automation in production.
- Discuss collaborative robots (cobots) and autonomous systems.

4. Predictive Maintenance Using IIoT and Machine Learning

- Analyze the role of IIoT and machine learning in predicting equipment failures.
- Explore how these technologies optimize maintenance schedules.

5. Enterprise Resource Planning (ERP) Systems in a Digital Factory

- Examine how ERP systems streamline production and inventory management.
- Present case studies on successful ERP implementations.

6. Cybersecurity Challenges in Connected Factories

- Explore the cybersecurity risks associated with connected manufacturing.
- Discuss strategies to secure factory networks and data.

7. Cloud Computing in Digital Factories

- Investigate the role of cloud platforms in managing factory data.
- Discuss how cloud solutions enable better collaboration and scalability.

8. Human-Machine Interfaces (HMI) in the Smart Factory

- Research how advanced HMIs enhance operator interaction with systems.
- Explore the benefits of AR/VR and real-time data interfaces.

9. Additive Manufacturing (3D Printing) and Its Impact on the Digital Factory

- Discuss the integration of 3D printing in digital factories.
- Explore applications like rapid prototyping and custom production.

10. Condition Monitoring in Digital Factories

- Examine real-time condition monitoring systems for machine health.
- Discuss how these systems improve operational efficiency.

11. The Use of AR and VR in Training and Maintenance

- Investigate how AR/VR technologies are used for training and remote maintenance.
- Highlight examples of AR-guided assembly and virtual repairs.

12. Sustainable Manufacturing and the Digital Factory

- Research how digital factories adopt sustainable practices.
- Discuss energy efficiency, waste reduction, and eco-friendly processes.

13. Role of Product Data Management (PDM) in Collaborative Engineering

- Explore how PDM facilitates data sharing in product design.
- Discuss the benefits of collaborative engineering in digital factories.

14. Advanced Robotics and AI in Quality Control

- Discuss how AI-powered robots are used in quality control processes.
- Highlight examples of defect detection and product consistency checks.

15. Impact of Industry 4.0 on Supply Chain Management

- Analyze how Industry 4.0 technologies transform supply chains.
- Provide examples of smart supply chain management.