

Basics of Digital Manufacturing

| Course Workload | | Assessment form (examination/ graded test/ ungraded test) |
|-----------------|-------|---|
| ECTS | Hours | |
| 3 | 108 | Graded test |

The discipline covers digital tools used to solve routine and complex tasks in modern manufacturing, from designing new products to their production and quality control. You will learn the difference between "Digital Manufacturing" and "Smart Factory," how to use the Internet of Things in the enterprise, why monitoring systems should be implemented, and how to utilize big data on the factory floor. We will explain how modern approaches to production organization help improve its efficiency.

Course structure:

1. Digital Manufacturing: Key Concepts and Definitions

- 1.1. Main Stages of Manufacturing Development
- 1.2. Characteristics of Digital Manufacturing: Key Trends in Industry. "Smart Factories"

2. Digital Design

- 2.1. Automated Design and Product Development Systems, Engineering Analysis Systems, Production Process Simulation Systems
- 2.2. New Manufacturing Technologies

3. Modern Industrial Manufacturing Technologies

- 3.1. Robotics. "Internet of Things" in Manufacturing. "Digital Twin". Production Process Monitoring Systems
- 3.2. Additive Technologies: Opportunities and Future Prospects

4. Organization of Digital Manufacturing

- 4.1. Efficiency of Digital Manufacturing. Promising Directions in Advanced Manufacturing Organization
- 4.2. Modern Trends in Production Organization and Management Technologies