



Manufacturing Automation (6063-M)

5 ECTS**Lecturer: D. Bračun**Lectures: 30h | Tutorials: 8h | Labs: 22h | Project: 0h | Lang.: 

Objectives

The objectives of this course are to be understood:

- The use of automation to improve productivity and quality in production.
- The integration of basic mechatronic components in automated systems.
- The synthesis of measuring and mechatronic systems in automated inspection devices.
- The basic methods of localization and product identification.
- The use of machine vision in automation and inspection.
- The definition of performance and security of automated systems.

Programme

1. Introduction, automation types and approaches
2. PLC controllers, system integration
3. Numerically controlled and robotic systems
4. Automated inspection devices
5. Machine vision
6. Localization
7. Scada systems, automatic identification and data acquisition
8. Performance of automation systems

Prerequisites

To attend this course, the students are expected to:

- Understand basic concepts in mechanics, machine elements, mechatronics, and simple programming.

Learning outcomes

After attending this course, the student will obtain the following knowledge/skills:

- How to use automation to improve efficiency and reduce variability in production.
- Synthesis of basic building blocks of automation, localization, identification, automated inspection, use of machine vision and safety in automated systems. With the acquired competences, students can develop basic automated systems.
- Development of specifications, programming and testing of automated systems.
- Design, implementation and calibration of automated inspection devices and their integration into industrial information systems.
- Use of machine vision for automation and product inspection purposes.

Assessment

50% Theoretical exam, 30% Laboratory work, 20% Project seminar

Literature

1. Springer Handbook of Automation; Shimon Y. Nof, Springer, Berlin, Heidelberg 2009
2. Robotics, Vision and Control; Peter Corke, Springer, Berlin, Heidelberg 2011
3. Automation, Production systems, and Computer-Integrated manufacturing, Mikell P. Groover, Pearson Prentice Hall, 2008
4. Image Processing with Python, I.A. Ansari, IOP Publishing, 2024
5. Custom learning materials prepared by the lecturers.