



# Manufacturing Automation

5 ECTS

**Lecturer:** D. Bračun

Lectures: 30h | Tutorials: 14h | Labs: 16h | Project: 0h |

Lang.: 

## Objectives

---

The objectives of this course are to understand:

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

## Programme

1. Types of automation, basic building blocks
2. Robotic systems
3. Numerically controlled systems
4. Automation of material flow
5. Localization
6. Process and product control
7. Systems for monitoring and control of manufacturing
8. Automatic identification and data acquisition
9. Imaging systems in automation
10. Specifics of image processing
11. Imaging systems calibration
12. Example applications of imaging systems in automation
13. Automated inspection devices
14. Performance of automation systems

## Prerequisites

In order to attend this course, the students are expected to:

- Have basic experience with industrial or manufacturing engineering.

## Learning outcomes

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

- The course deals with the use of automation to improve efficiency and reduce variability in production, synthesis of basic building blocks of automation, localization, identification, automated inspection devices, use of machine vision, performance and safety in automated systems. With the acquired competences, students are able to develop automated systems.
- Development of specifications, synthesis of basic building blocks of automation, 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, 20% Laboratory work and report, 30% 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. Digital Image Processing using Matlab, Rafael C. Gonzalez, Pearson Prentice Hall, 2008