



Laser Processing Technology

5 ECTS

Lecturer: M. Jezeršek, P. Gregorčič

Lectures: 30h

| Tutorials: 10h

| Labs: 20h

| Project: 0h

| Lang. :



Objectives

The objectives of this course are:

- Understanding the principles of interaction between laser light and matter.
- Introduction with some laser processing processes and associated optomechatronic systems.
- Impact of laser parameters on process efficiency and quality.
- Introduction with process control methods.

Programme

1. Interaction of laser light with matter
2. Thermal phenomena
3. Photochemical phenomena
4. Optodynamic phenomena
5. System parameters of laser processing
6. Laser drilling, cutting, engraving
7. Laser welding
8. Laser surface engineering
9. Laser 3D printing
10. Laser Medical Systems and Interventions
11. Diagnostics of machining processes
12. Adaptive control of laser processes

Prerequisites

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

- Understand the basics of optics and the basics of the physics of light.

Learning outcomes

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

- Thorough theoretical, methodological and analytical knowledge with elements of a research work that form a basis for very demanding professional work in the field of laser machining processes.
- Planning and managing of the working process on the basis of creative solving of problems that are linked to the teaching and training of the laser processing technology.

Assessment

25% theory, 25% theoretical calculus, 25% laboratory work, 25% laboratory work reports

Literature

1. W.M. Steen, Laser Material Processing (4th Edition), Springer Verlag, 2010
2. E. Kannatey-Asibu, Principles of laser materials processing, John Wiley & Sons, 2009
3. J.F. Ready, Industrial Applications of Lasers, 2nd. ed., Academic Press, 1997
4. Dieter Schuoecker, High Power Lasers in Production Engineering, Imperial College Press, 1999.