MICRO-301 **Physics of manufacturing**

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Cursus	Sem.	Type
Microtechnics	BA6	Obl.

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
Exam	Written
Workload	120h
Weeks	14
Hours	**4 weekly**
Courses	2 weekly
Exercises	1 weekly
TP	1 weekly
Number of positions	

Summary

This course gives an introduction to production methods and manufacturing technologies used in microengineering. The focus is given on the understanding of physical phenomena underlying the processes, the relation between materials/manufacturing processes and design, as well as economical aspects.

Content

The lectures are organized as follows:

1. Introduction - Material selection
2. Surfaces
3. Laser processing I
4. Laser processing II
5. Forming
6. Casting and Molding
7. Conventional machining
8. Unconventional processes
9. Cost of manufacturing & Process monitoring
10. Assembly I
11. Assembly II -
12. Exercises

Keywords

Manufacturing, packaging, physics of manufacturing processes

Learning Outcomes

By the end of the course, the student must be able to:

- Formalize requirements for a manufacturing process considering a given design
- Analyze a given manufacturing process
- Optimize the choice of material for a manufacturing problem
- Analyze economical aspects for manufacturing

Teaching methods

Note that the course is given in French, but lectures notes are in English.

Assessment methods

- Written exam at the end of the course (60% of the grade)
- Reverse engineering project (40% of the final grade)

Supervision

Office hours	Yes
Assistants	Yes
Forum	No

Resources

Bibliography

- M. Ashby, Materials selection in Mechanical Design, 4th edition, Elsevier
- M.C. Shaw, P.K. Wright, S. Kalpakjian, Manufacturing Engineering & Technology, Pearson

Ressources en bibliothèque

- Manufacturing Engineering & Technology / Kalpakjian
- Materials selection in Mechanical Design, 4th ed