ME-413

Introduction to additive manufacturing

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Cursus	Sem.	Type
Mechanical engineering minor	H	Opt.
Mechanical engineering	MA1, MA3	Opt.
Microtechnics	MA1, MA3	Opt.

Language of teaching	English
Credits	3
Session	Winter
Semester	Fall
Exam	Written
Workload	90h
Weeks	14
Hours	**3 weekly**
Courses	2 weekly
TP	1 weekly
Number of positions	

Summary

This course describes the main additive manufacturing processes. It compares them to traditional processes (advantages, disadvantages, costs) and identifies typical areas of use.

Content

1. General introduction to manufacturing and to additive manufacturing
2. Photopolymer based processes (SLA,Polyjet,..)
3. Extrusion processes (FDM,BPM...)
4. Powder based processes (L-PBF, E-PBF, BJ...)
5. Computer aspects of additive manufacturing

Keywords

Additive manufacturing, Stereolithography, Fused deposition modelling, Laser or Electron beam powder bed fusion, binder jetting,

Learning Outcomes

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

- Classify general production processes
- Choose an appropriate AM process for a given manufacturing application
- Assess / Evaluate the limitations and the costs of an AM process
- Implement an AM production on a specified machine

Teaching methods

Ex cathedra lecture + individual or group project

Expected student activities

1. Exercises to be solved
2. Report and oral presentation on a free subject related to additive manufacturing

Assessment methods

1. Final written exam
2. Project report and oral presentation

Resources

Ressources en bibliothèque

- Manufacturing Engineering and Technology / Kalpakjian
- Additive Manufacturing Technologies / Gibson, Rosen, Stucker

Moodle Link

- https://go.epfl.ch/ME-413