

MICRO-413

Advanced additive manufacturing technologies

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Cursus	Sem.	Type
Mechanical engineering	MA2, MA4	Opt.
Microtechnics	MA2, MA4	Opt.
Mineur STAS Chine	E	Opt.

Language of teaching	English
Credits	3
Withdrawal	Unauthorized
Session	Summer
Semester	Spring
Exam	Oral
Workload	90h
Weeks	14
Hours	3 weekly
Courses	2 weekly
Exercises	1 weekly
Number of positions	40

It is not allowed to withdraw from this subject after the registration deadline.

Summary

Advanced 3D forming techniques for high throughput and high resolution (nanometric) for large scale production. Digital manufacturing of functional layers, microsystems and smart systems.

Content

High speed 3D printing with polymers (DMD based)
 Fabrication methods for 3D nanometric resolution
 Drop on demand digital printing
 Hybrid printing: 3D printing with embedded electronic functionalities

Keywords

Micro-nano 3D manufacturing
 Drop on demand printing
 Ink formulation
 High speed light management
 Hybrid printing

Learning Prerequisites**Required courses**

- 40 students maximum (first come first serve if more than 40).
- required course: ME-413

Learning Outcomes

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

- Select appropriately advanced printing methods for a given printing requirement
- Realize 3D printing concepts and their limitations
- Match different printing methods to realize multi-functional 3D structures
- Manipulate advanced 3D printing equipment

Assessment methods

Oral + TP

Resources

Notes/Handbook

Selected sections (PDF format) in books:

Microdrop generator, Eric Lee, CRC press

Surface tension in microsystems, Springer

Additive Manufacturing Technologies, Ian Gibson, David Rosen, Brent Stucker, Springer

Selected papers and course slides.