Advanced additive manufacturing technologies

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
Industry speakers on selected topics of advanced additive manufacturing

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.