MSE-657

CCMX Winter School - Additive Manufacturing of Metals and the Material Science Behind It

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Cursus	Sem.	Type
Materials Science and Engineering		Obl.

Language of teaching	English
Credits	2
Session	
Exam	Oral presentation
Workload	60h
Hours	**28**
Courses	20
Exercises	8
Number of positions	**24**

Frequency

Every year

Summary

This course is designed to cover a series of important scientific aspects related to the field of additive manufacturing of metals and alloys and to provide an in-depth review of corresponding fundamentals. It features 9 modules consisting of presentations given by lecturers and the participants.

Content

Please find information on the link below.

Keywords

Additive manufactuing, metals, atomistic modelling, rapid solidification, alloys for additive manufacturing, in situ experiments,
Laser/e-beam - material interactions
Atomistic modelling of solidification in out-of-equilibrium conditions
Fundamentals of rapid solidification
Optimization of alloys for AM
In situ experiments with Xrays and neutrons at large facilities
Post-treatments, microstructure evolutions and properties
EBM processing and contrast with the SLM approach
Important aspects to be considered in industrial applications

The course is organised as a 5 day retreat to allow for extensive informal interactions.

Learning Prerequisites

Required courses

Participants should be educated in materials science and engineering, physics, mechanical engineering or physical chemistry to benefit the most from this course.

Assessment methods

Oral presentation (prepared based upon a series of publications provided by the lecturers)

Resources

Websites

- https://ccmx.epfl.ch/past-courses-and-events/additive-manufacturing-in-metals-and-the-materials-science-behind-it-winter-school-20