

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		Opt.

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

### Frequency

Every 2 years

### Remark

Next time: Winter 2021/2022 (the course will be given only if the sanitary situation allows to be in person)

### 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 manufacturing, 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>