

MSE-673

Nanoparticles: from fundamentals to applications

Amstad Esther, Invited lecturers (see below), Leemans Jari, Stellacci Francesco

Cursus	Sem.	Type
Materials Science and Engineering		Opt.

Language of teaching	English
Credits	2
Session	
Exam	Oral presentation
Workload	60h
Hours	36
Lecture	30
Project	6
Number of positions	

Frequency

Only this year

Summary

This Summer School examines important scientific aspects regarding the development, characterization and application of nanoparticles for medical applications and provide an in-depth review of corresponding fundamentals.

Content

Material synthesis ## inorganic nanoparticles (Jari Leemans, EPFL); Physical, chemical characterization of inorganic nanomaterials (Lionel Maurizi, University of Bourgogne); Challenges in the synthesis and characterization of 2D materials (Giacomo Reina, Empa); Material synthesis and characterization ## organic nanoparticles (TBC); Bio-inspired processing (Esther Amstad, EPFL); Microfluidics (Andrew de Mello , ETHZ); Surfaces and Interfaces (Francesco Stellacci, EPFL); Nanomaterials-Cell interactions (Peter Wick, Empa); Principles in nanosafety research (Peter Wick, Empa); Measurement science and reliability (TBC); GMP and upscaling (TBC); Regulatory science (Scott McNeil, University of Basel); mRNA Vaccines/Pharmacopoeia (Gerrit Borchard, University of Geneva).

These lectures will be complemented by a site visit as well as talks on starting a company (Startup Launchpad, EPFL) and non-linear career paths (Georgette Salieb-Beugelaar, FH Muenster).

Keywords

Nanomaterials, nanoparticles, material synthesis, nanosafety

Learning Prerequisites**Recommended courses**

Prospective students should have completed an undergraduate degree in materials science, chemistry, physics or some other relevant field.

Assessment methods

Oral presentation

Resources**Websites**

- <https://www.epfl.ch/research/domains/ccmx/courses-and-events/2024nanoparticles/>

Moodle Link

- <https://go.epfl.ch/MSE-673>