Summary
This course aims at giving an overview on the synthesis of nanoparticles, with more focus on colloidal chemistry, and their implementation into devices for energy applications (batteries, solar cells, artificial photosynthesis, light emitting diodes, electrochromic windows).

Content
General properties of nanoparticles and characterization tools
Introduction to different synthetic approaches to nanoparticles
Colloidal synthesis
Classical Nucleation Theory for homogeneous and heterogeneous nucleation
Control on size, shape and composition of nanoparticles
General intro to implementation of nanoparticles into devices
Application of nanoparticles in photoelectrochemical cells
Application of nanoparticles for CO2 reduction (electrochemical and thermochemical)
Application of nanoparticles in batteries
Application of nanoparticles in electrochromic windows
Application of nanoparticles in solar cells
Application of nanoparticles in light emitting diode
The basic working principles and figure of merit for each energy device will be described.

Keywords
• Colloidal Chemistry
• Nanoparticles
• Energy Devices

Assessment methods
Oral presentation
Resources

Bibliography

Course note and journal papers will be provided during the course.