Level: master

**Course title: Nanomaterials** 

Status: obligatory

**ECTS**: 7

**Requirements**:

Learning objectives

Introducing students to the field of nanosized structures.

## Learning outcomes

- Upon completion of the course, students should have developed:
- General skills: to follow the professional literature;
- Knowledge of the characteristics of nanostructured materials;
- Knowledge of the processes and technologies for obtaining nanomaterials;
- Ability of science-based understanding of the physical processes and interpretation of physical

phenomena of the nanostructured materials.

## Syllabus

Theoretical instruction

Energy of surfaces. Chemical potential and electrostatic stabilization. One-dimensional, twodimensional and three-dimensional interactions. Nanoparticles, one-dimensional, two-

dimensional and three-dimensional nanostructures. Special nanomaterials.

Obtaining by colloidal techniques, chemical and electrochemical methods, evaporation and condensation; synthesis in plasma. Characterization of nanomaterials: structure, chemical and physical properties, electrical conductivity, ferroelectric and dielectric properties; superparamagnetism.

Application of nanomaterials.

## Practical instruction

Experimental exercises, preparation and presentation of seminar papers that accompany the content of lectures.

Weekly teaching load				Other:
Lectures: 2	Exercises: 1	Other forms of teaching: 1	Student research:	