Level: master

Course title: NANOMATERIALS CHEMISTRY, IHA-504

Status: elective

ECTS: 5

Requirements: none

Learning objectives

Introduction to the chemistry of nanomaterials as a new and advanced chemical concept. Development of the critical attitude towards role and importance of nanochemistry and nanotechnology. Acquiring necessary theoretical knowledge on synthesis and application of nanomaterials.

Learning outcomes

After successful completion of this course, students are able to:

- demonstrate knowledge on fundamental physical and chemical properties of substances on the molecular level;
- demonstrate knowledge on basic concepts and principles of nanochemistry;
- consult the relevant literature;
- explain applications of nanotechnology in modern chemistry, medicine, industry, etc;
- apply knowledge of basic nanochemical phenomena in solving unfamiliar problems.

Syllabus

Theoretical instruction:

Basic principles of nanotechnologies and nanosystems. Nanotechnology today and in the future (molecular manufacturing). History of nanotechnology and its importance in the future. Synthesis and properties of carbon nanoforms (fullerenes, carbon nanotubes, graphene...), nano-silica, nano-metals, nanopores. Experimental techniques based on nanoscales (AFM, STM and MFM). Possibility of applying the nanosystems, nanoparticles and nanotechnology in the different fields (medicine, pharmacy, industry, environmental protection).

Practical instruction:

Tasks and problems in accordance with the theoretical syllabus.

Weekly teaching load				Other:
Lectures: 2(30)	Exercises: 2(30)	Other forms of teaching:	Student research:	