1. Course title
Nanofysik ock nanokemi
Nanophysics and Nanochemistry

2. Course code
MATR305

3. Course status: optional

4. Course level (first-, second-, third-cycle/EQF levels 6, 7 and 8)
Master’s level, degree programmes in medicine, dentistry and veterinary medicine = second-cycle degree/EQF level 7
Doctoral level = third-cycle (doctoral) degree/EQF level 8
5. Recommended time/stage of studies for completion

An overview of research activities in Nanophysics and Nanochemistry in Kumpula Campus offered in the course is useful at the stage when a future career choice is to be made.

6. Term/teaching period when the course will be offered

The course is offered every year in the autumn during the second teaching period.

7. Scope of the course in credits

5 cr

8. Teacher coordinating the course

Flyura Djurabekova

9. Course learning outcomes

After completing the course you will have an understanding of:

- what is the nanoscience and what is its role in the modern society
- what are the branches of nanoscience in general and what branches are under research in Kumpula Campus

10. Course completion methods

The course is offered in form of scientific overview lectures given by the experts in each field presented during the course.

The 100% attendance is recommended as the lecture notes contain the slides on original research, inviting the students to have critical viewpoints and feedbacks.

The course is completed by submitting weekly short essays on every lecture, where the important aspects given by the lecturer and in the student's own opinion must be highlighted. The final examination is held at the end of the course.

11. Prerequisites

The course “Basics of Nanoscience”.

12. Recommended optional studies

Computational Nanoscience, Chemistry of thin films

13. Course content

- Atom-level methods to build and characterise the nanostructures
- Properties of nanoobjects: mechanical, electronic and magnetic, optical
- Physical and chemical methods to form nanoobjects: nanoparticles, nanoclusters, nanopillars/nanowires, nanofilms, bulk nanomaterials
- Carbon-based nanostructures
- Inorganic thin films
- Aerosol nanoparticles

14. Recommended and required literature

Lecture notes.
15. Activities and teaching methods in support of learning

Lectures are given two times a week for 7 weeks. An essay emphasising important and critical points is written after every lecture. The final exam is written at the end of the course.

16. Assessment practices and criteria, grading scale

The essays submitted by students are graded regularly. The final score can be used as a weighting factor up to 20% for the grade of the final exam. No returned esseys reduce the overall grade of the final exam by 20%.

17. Teaching language

English.