

Title: Applied of Organic Chemistry.

Lecturer: Andrei N. Yankin

Assistants: Venera D. Gilemkhanova

Short annotation:

This course is an intensive, comprehensive introduction to the chemistry of carbon and its importance to biological molecules. Topics include current ideas of bonding and structure, major reaction mechanisms and pathways, a discussion of the analytical tools used to determine the structure and stereochemistry of organic compounds.

Study program and semester: Quantum and hybrid materials, third semester

Detailed content of the course:

1. The current state of the theory of chemical structure.
2. Influence of atoms in molecules.
3. Acid-Base properties of organic compounds.
4. Active particles in organic reactions.
5. Mechanisms of organic reactions.
6. Substitution reactions.
7. Addition and elimination reactions.
8. Tautomerism and dual reactivity.
9. Rearrangement reactions.

Laboratory Works:

1. Distillation under atmospheric pressure, recrystallization, TLC.
2. Distillation under vacuum, extraction.
3. Synthesis of fluorescent dye.
4. Synthesis of Porphyrin.
5. Synthesis of Pyrrole.
6. Synthesis of polymer nanoparticles.

References:

1. M.B. Smith, J. March. March's Advanced Organic Chemistry. Wiley: New Jersey, 2007.
2. E.V. Aslyn, D.A. Dougherty. Modern Physical Organic Chemistry. University science books, 2006.
3. W. C. Groutas. Organic Reaction Mechanisms. Selected Problems and Solutions, 1st Edition. Wiley: New York, 2000.
4. <https://chem.libretexts.org>

Courses needed:

Organic and inorganic chemistry

Evaluation of course progress (grading policy) and examples of assignments:

Final grade is based solely on the final exam. Solution of the homework problems is strongly recommended to be able to solve the problems at the exam.