

Department of Pharmaceutical Analysis and Nuclear Pharmacy
winter term 2025/2026

Ordinance

LECTURES and PRACTICALS on Analysis of Substances in Biological Systems

Lectures (1 hour per week) and practicals (2 hours per week) on Analysis of Substances in Biological Systems for 3rd and 4th year are held in the room OSM5 (room N° 141).

Lectures: Tuesday 14:50-15:40

Teachers: Mgr. Michal Hanco, PhD., RNDr. Jana Havlíková, MSc. PhD.

Practicals: Tuesday 15:45-17:25

Teachers: Mgr. Michal Hanco, PhD., RNDr. Jana Havlíková, MSc. PhD.

Guaranteed by: prof. RNDr. Peter Mikuš, PhD.

Attendance on lectures and practicals is mandatory. Absence of students is not accepted without a bill of health from the doctor. Justified absence must be additionally substituted according to instructions from the teacher. Absence exceeding 1/3 of the total teaching process is not accepted.

Conditions for course completion

Presentation of the seminar work on the given topic. Students choose the topic of their seminar work from the list of topics proposed by the teachers at the beginning of the semester. The presentation is a prerequisite for the examination.

Examination

Examination is conducted in the form of a written test. Examinations are divided into a regular term, the first and the second reparation. If the obtained score in the second reparation is lower than 60%, the student fails the course.

CLASSIFICATION SYSTEM:

A	92%
B	84%
C	76%
D	68%
E	60%
FX	<60%

Additional and recommended literature/sources for theoretical study:

1. Mikuš, Peter, Maráková, Katarína. Hyphenated electrophoretic techniques in advanced analysis. Bratislava: KARTPRINT, 2012
2. Watson, David G. Pharmaceutical analysis: A Textbook for Pharmacy Students and Pharmaceutical Chemists, 5th ed. London: Elsevier, 2020
3. Ramesh, Vasudevan, ed. Biomolecular and Bioanalytical Techniques: Theory, Methodology and Applications. Hoboken: Wiley, 2019
4. Manz, Andreas, Petra S. Dittrich, Nicole Pamme, and Dimitri Iossifidis. Bioanalytical Chemistry. 2nd ed. London: Imperial College Press, 2015.
5. Mikkelsen, Susan R., and Eduardo Cortón. Bioanalytical Chemistry. 2nd ed. Hoboken: Wiley, 2016.
6. Gross, J. H. Mass Spectrometry: A textbook. 3rd ed. Springer, 2017
7. Research papers and review articles with appropriate key words (e.g., biological samples, blood, serum, plasma, urine, tissue, plant, drug, enzyme, substrate, antigen, antibody, sample preparation, clinical analysis, spectral methods, IR, MS, NMR, electrochemical methods, biosensors, separation methods, electrophoresis, chromatography, biochemical methods, enzymatic methods, immunological methods, PCR, metabolomics, proteomics)

In Bratislava, 18. 09. 2025

prof. RNDr. Peter Mikuš, PhD.

head of department

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Schedule

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| 23. 09. 2025 | Introduction to bioanalysis, endogenous and exogenous substances as analytes in complex biological samples |
| 30. 09. 2025 | Characteristics of biological materials, sample collection, handling, storage, preparation, and pretreatment |
| 07. 10. 2025 | Enzymatic and immunochemical analytical methods in bioanalysis |
| 14. 10. 2025 | Electrochemical biosensors |
| 21. 10. 2025 | Chromatographic bioanalytical methods |
| 28. 10. 2025 | Electrophoretic bioanalytical methods |
| 04. 11. 2025 | Spectral methods in bioanalysis – UV-VIS |
| 11. 11. 2025 | Spectral methods in bioanalysis – Mass spectrometry |
| 18. 11. 2025 | Validation of bioanalytical method |
| 25. 11. 2025 | Analytical methods in therapeutic drug monitoring (study of pharmacokinetics, biodistribution and elimination of drugs) |
| 02. 12. 2025 | Analytical methods in metabolomics |
| 09. 12. 2025 | Analysis of peptides and proteins – proteomics |
| 16. 12. 2025 | Seminar work presentation |