

Level: bachelor				
Course title: Principles of Instrumental Analysis (Z-301)				
Status: obligatory				
ECTS: 9				
Requirements: none				
Learning objectives Providing a wide base of fundamental knowledge about the physical and physico-chemical principles necessary for understanding the principles of analytical instruments. Understanding the role, importance and application areas of instrumental methods of analysis. Developing practical skills and ability to handle simpler instruments and apply the standard methodology in solving problems and tasks in the field of instrumental analysis.				
Learning outcomes Students should be able to: <ul style="list-style-type: none"> • Identify where the instrumental methods of analysis are used in contemporary environment; • Demonstrate fundamental knowledge of key concepts in solving basic known or unknown analytical problems and quantitative tasks; • Properly handle simple instruments for physical-chemical analysis of given samples; • Implement appropriate laboratory procedures (optical, electroanalytical, chromatographic and other methods) in solving practical problems of instrumental analysis; • Reliably, accurately and precisely measure when performing the set of instrumental analysis and to interpret the experimental results and write reports on the analysis that was performed. 				
Syllabus <i>Theoretical instruction</i> The objective and principles of instrumental methods of analysis. Signal and analytical information. Measurement, transformation and registration of signal. Quality of measuring instrument and measurement results. Optical methods of analysis. Atomic emission and absorption spectrometry. Molecular absorption spectrometry. Fluorimetry. Other optical methods of analysis. Mass spectrometry. Electroanalytical methods. Conductometry. Electroanalytical separation. Coulometry. Voltammetry. Amperometry. Potentiometry. Thermoanalytical methods of analysis. Instrumental methods of separation. Gas chromatography. Liquid chromatography. Ion chromatography. Capillary electrophoresis. Selection of the optimal analysis. Processing experimental data. <i>Practical instruction</i> Practical instruction follows the theoretical instruction.				
Weekly teaching load				Other:
Lectures: 3	Exercises: 3	Other forms of teaching: 2	Student research:	