

**DEVELOPMENT OF ELECTRONIC COURSES OF THE DISCIPLINE
«ANALYTICAL CHEMISTRY» WITH THE SUPPORT OF DAAD***Leonova N.*Vasyl' Stus Donetsk National University, Vinnytsia, Ukraine
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Vasyl' Stus Donetsk National University was a part of a projects *Ukraine Digital 2022 and Ukraine Digital 2023*. During August-December 2022 we prepared educational materials for teaching Analytical Chemistry in electronic format with the support of DAAD together with Dr. PRYMAK Oleg from Universität Duisburg-Essen (Germany). During August-December 2023 we prepared educational materials for teaching Analytical Chemistry in electronic format with the support of DAAD together with Dr. LOZA Kateryna and Dr. PRYMAK Oleg from the University of Duisburg-Essen. The courses «Analytical Chemistry I» and «Analytical Chemistry II» were conducted for the the first and second year of the Bachelor's degree students study programme «Chemistry» according of Chemistry on the Faculty of Chemistry, Biology and Biotechnologies of Vasyl' Stus Donetsk National University.

The course program includes lectures and laboratory classes on the topics of qualitative and quantitative analysis. The online lectures were conducted through MS Teams. The course of «Analytical Chemistry I» contained the topics: «Methods of analytical chemistry», «Theory of analytical signal», «Qualitative analysis», «Classification of cations and anions», «Analysis of a substance of unknown composition», «Equilibrium in a homogeneous system», «Electrolytic dissociation», «Protolytic theory», «Buffer mixtures. Hydrolysis of salts», «Equilibrium in a heterogeneous system», «Redox equilibrium», «Metrological bases of chemical analysis», «Gravimetric analysis», «Titrimetric methods of analysis», «Acid-base titration». The course of «Analytical Chemistry II» contained the topics: «Methods of redox titration», «Permanganometry. Dichromatometry. Iodometry», «Precipitation titration», «Complexometric titration», «Instrumental methods of analysis», «Electrochemical methods of analysis. Potentiometric analysis. Potentiometric titration», «Voltammetry», «Conductometric method of analysis», «Coulometric method of analysis», «Methods of atomic optical spectroscopy. Atomic emission spectral analysis. Atomic absorption method of analysis», «Methods of molecular optical spectroscopy. Spectrophotometry. Luminescent analysis», «Chromatographic methods of analysis». The MS PowerPoint presentations containing lecture material were developed for all topics of the courses.

There were prepared 10 video materials of laboratory classes of the course of «Analytical Chemistry II»: «Determination of the content of sodium hydroxide and sodium carbonate when they are found together», «Determination of mass fraction of ammonium hydroxide in solution», «Determination of Cu content in the solution by iodometry», «Determination of water hardness», «Determination of total acidity of fruits and vegetables», «Determination of fluorides by direct potentiometry», «Spectrophotometric determination of copper ions in solution», «Photometric determination of total Ferrum content», «Formal titration of milk», «Chromatography on paper».

All presentations and video materials were shared with students on the Microsoft Teams group, the Portal of the Faculty and the Moodle platform. There were developed a bank of test tasks for two colloquiums for the course «Analytical Chemistry I» and one colloquium for the course «Analytical Chemistry II» on the Moodle platform.

Two electronic books were purchased with the support of DAAD: *Foundations of Analytical Chemistry / Miguel Valcárcel Cases, Ángela I. López-Lorente, Ma Ángeles López-Jiménez, Springer Cham, 2018, 487 p.* and *Analytical Chemistry / K. Danzer, Springer-Verlag Berlin Heidelberg, 2007, 316 p.*