

<b>Subject:</b> Alpha and beta spectroscopy		
<b>Course status:</b> Elective		
<b>Number of ECTS:</b> 15		
<b>Requirement:</b>		
<b>Course goals</b> To introduce students with physical methods and application of alpha and beta spectroscopy.		
<b>Outcome</b>		
<b>-General competences:</b> Gaining knowledge of the alpha and beta spectroscopy.		
<b>Specific capability:</b> Gaining knowledge about qualitative and quantitative analysis of specific types of nuclear radiation and the application.		
<b>Course content</b>		
<b>Lectures:</b> The interaction of alpha and beta radiation with matter. Alpha and beta decay. Alpha and beta emitters. Detection. Spectroscopy of alpha-radiation (characteristics of detector, the sample preparation). Beta spectroscopy (characteristics of detector, sample preparation). Detection of electrical signals and spectra processing. Qualitative and quantitative analysis of the spectra. Scintillation processes. The characteristics of the scintillator. Components of LSC cocktails. Interaction of alpha, beta and gamma radiation. Cherenkov radiation. Photomultipliers. Background radiation. Quench effects in a liquid scintillation spectrometry. Quench corrections. Counting statistics. Optimization of LSC measurements. Liquid scintillation detector. Energy calibration. Efficacy of alpha / beta detecton . Methods for different radioisotope determination.		
<b>Practical teaching:</b> Experimental exercises, calculation exercises.		
<b>Literature</b>		
<ol style="list-style-type: none"> <li>1. Michael F. L Annunziata, Handbook of Radioactivity Analysis, Academic Press, ISBN 0-12-436603-1</li> <li>2. K. Siegbahn, Alpha-, Beta- and Gamma Spectroscopy, North Holland, 1979, ISBN 9780720400830</li> <li>3. Charles J. Passo, Gordon T. Cook, Handbook of Environmental Liquid Scintillation Spectrometry, Pacard Instrument Company, 1994</li> </ol>		
<b>Number of active teaching</b>	<b>Theoretical classes: 6</b>	<b>Study research: 4</b>
<b>Teaching methods</b> Theoretical study is carried out using modern methods of presentation, with the active participation of the student, and practical teaching includes laboratory exercise and presentation of seminary work.		