

Level: bachelor				
Course title: Electroanalytical chemistry				
Status: elective				
ECTS: 7				
Requirements: none				
Learning objectives Increasing knowledge about the physical, physico-chemical, biochemical, and instrumental chemical principles necessary for understanding the principles of electroanalytical chemistry. Extending the understanding of the role, importance and areas of application of electroanalytical techniques/methods of measurement. Training students in practical skills that enable professional and independent handling of electroanalytical measurement techniques. Improving students' knowledge in solving problems / tasks in the field of electroanalytical chemistry.				
Learning outcomes Ability to apply knowledge of electroanalytical methods and to understand the methodology for the selection of suitable measurement techniques and methods to solve complex analytical tasks / issues using simple devices. Ability to independently and critically apply knowledge and understanding of facts, concepts, principles and theories in solving the unknown electroanalytical problems in laboratory and field conditions. Ability to independently handle the measurement techniques for physical-chemical, biochemical or electroanalysis of different samples. Choose, and if necessary, optimize/modify/adapt and implement appropriate laboratory procedures/methods in solving practical problems using electroanalytical techniques.				
Syllabus <i>Theoretical instruction</i> Practical aspects (electrochemical cell, solvents and supporting electrolytes, oxygen, instrumentation, working electrodes). Investigation of electrodic reactions. Nature of interfaces. Spectroelectrochemistry. Quartz crystal microbalance. Impedance spectroscopy. Potentiometry (basics of potentiometry, ionoselective electrodes). Conductometry. Coulometry. Electrogravimetry. Techniques with controlled potential (chronoamperometry, polarography, cyclic voltammetry, pulse voltammetry, stripping analysis). Electroporesis. <i>Practical instruction</i> Electrogravimetric determination of Cu. Coulometric determination of HCl. Potentiometric determination of chloride. Cyclic voltammetric characterisation of selected redox system. Stripping voltammetry of target analyte. Amperometric determination of H ₂ O ₂ . Electroforesis.				
Weekly teaching load				Other:
Lectures: 3	Exercises: 3	Other forms of teaching:	Student research:	