

Subject name	Instrumental Analysis	
Subject code	E.1.IAXX.SC.ECTIE.R	
Department	Agricultural and Environmental Chemistry	
Faculty	Agriculture and Economics	
Subject supervisor/Lecturer	Prof. Florian Gambuś, Dr. Jerzy Wiczorek, Dr. Marcin Niemiec	
General information	semester	winter
	ECTS credits	6
	Lectures total	10 hrs
	Laboratories	15 hrs
Objective and general description	<p>Scientific basis and construction of principles of analytical instruments, as well as their functioning and usability in agricultural and environmental research, according to chosen electrochemical , titrimetric, spectroscopic and chromatographic methods. In laboratory students will work with different modern analytic equipment, measuring and assessing accuracy, precision and detection limit of selected methods for determining elements of the environmental materials.</p> <p>Lectures</p> <ol style="list-style-type: none"> 1. Classification of instrumental methods and preparation of samples for analysis; 2. Incineration and wet mineralization of samples; 3. Atomic Absorption Spectroscopy (AAS); 4. Atomic Emission Spectroscopy – Plasma Emission Spectroscopy (ICP); 5. Chromatography and errors in sample analysis. <p>Laboratories</p> <ol style="list-style-type: none"> 1. Preparation and dissolving samples of soil and plant material before analysis; 2. Operation of UV-VIS Spectrophotometer (Beckman DU600) and its application for environmental material analyses. 3. Operation of Atomic Absorption Spectrometer (Solaar M6) and its application for environmental material analyses. 4. Operation of Atomic Emission Spectrometer (ICP- AES-Jobin-Yvon 238 Ultrace) and its use for environmental material analyses. 5. Hydraulic conductivity measurement. 	
Assessment method	Written examination; participation in lab	
References	<p>Kim H. Tan: Soil Sampling, Preparation and Analysis- second edition, Marcel Dekker, Inc. New York, USA, ss. 408 : Soil Sampling, Preparation and Analysis. CRC Press Taylor and Francis Group LLC, Boca Raton, USA, ss.623</p> <p>Kim H. Tan</p>	