Course title:	Elemental analysis of biomass and soils
Course title in Polish:	Analiza składu pierwiastkowego w biomasie i glebach
Course for discipline:	Agriculture and Horticulture

Semester:	3	**Status of course:**	basic	**Language:**	English
Academic year:		**Catalog number:**			

Coordinator of course:	dr hab. Jerzy Jonczak, prof. WULS
Lecturer od course:	dr hab. Jerzy Jonczak, prof. WULS
Executing unit:	Institute of Agriculture, Department of Soil Science
Ordering unit:	Doctoral School SGGW
Assumptions, goals and description of the course:	The purpose of the course is to familiarise doctoral students with chosen problems of elemental composition analysis in biomass and soils, including digestion and extraction techniques and the determination of concentrations by ICP-OES. The course will cover the following topics: (1) techniques for mineralisation of biomass samples for elemental composition determination, (2) selection of reagents for mineralisation of biomass and soil samples for elemental composition analysis (3) extraction of soils for analysis of selected forms of elements in soils, (4) basics of ICP-OES technique, (5) basics of ICP-OES spectrometer operation, (6) selection of ICP-OES spectrometer operating conditions depending on matrix
Didactic form, number of hours:	Lecture + laboratory exercises, 10h
Teaching methods:	Lecture with presentations, laboratory analysis of samples
Limit of people in the group:	10

Learning outcomes

KNOWLEDGE - the graduate knows and understands:	**SKILLS - the graduate is able to:**	**COMPETENCES - the graduate is ready to:**
To the extent enabling to revise the existing pradigms in the field/discipline - the world achievments, gathering theoretical background as well as general and selected detailed issues	Carry out critical assessment of the scientific research findings and expert activities and their contribution to the knowledge development in the field/discipline	Critically evaluate the achievments in the field/discipline represented
Major general development trends in the field/discipline		Recognise knowledge in solving cognitive and practical problems characteristic for the area of research (field/discipline) and in an interdisciplinary aspect
		Support the ethos of scientific circles and conduct independent research

The method of verification of learning outcomes:	test
Form of documentation of achieved learning outcomes:	test
Elements and weights of the final grade:	result of the test: 100%
Place of the course:	Department of Soil Science

Basic and supplementary literature

Cygański A. 2022. Metody spektroskopowe w chemii analitycznej. WNT, Warszawa

Comments:	

Estimated number of hours of work of the doctoral student necessary to achieve the assumed learning outcomes:	

Leraning outcomes reference to the second degree characteristics of the National Qualification Framework (level 8) covering doctoral competences:

Symbol:	**Learning outcomes:**	**8 level NQF**
SD1_KW01	To the extent enabling to revise the existing pradigms in the field/discipline - the world achievments, gathering theoretical background as well as general and selected detailed issues	P8S_WG
SD1_KW02	Major general development trends in the field/discipline	P8S_WG
SD1_KU05	Carry out critical assessment of the scientific research findings and expert activities and their contribution to the knowledge development in the field/discipline	P8S_UW
SD1_KK01	Critically evaluate the achievments in the field/discipline represented	P8S_KK
SD1_KK03	Recognise knowledge in solving cognitive and practical problems characteristic for the area of research (field/discipline) and in an interdisciplinary aspect	P8S_KK
SD1_KK08	Support the ethos of scientific circles and conduct independent research	P8S_KR