Course title:	Chromatography
Course title in Polish:	Chromatografia
Course for discipline:	Agriculture and Horticulture

Semester:	6	**Status of course:**	faculty	**Language:**	english
Academic year:		**Catalog number:**			

Coordinator of course:	Dr. Jarosław Leon Przybył
Lecturer od course:	Dr. Jarosław Leon Przybył, Dr. Sylwia Styczyńska
Executing unit:	Institute of Horticultural Sciences, Department of Vegetable and Medicinal Plants
Ordering unit:	Doctoral School SGGW
Assumptions, goals and description of the course:	Mastery of the knowledge and skills required for the qualitative and quantitative assessment of the quality of plant material using modern chromatographic methods. This includes thin-layer chromatography (TLC), high-performance liquid chromatography (HPLC) with a diode array detector (DAD), a fluorescence detector (FLD) and a scattered light detector (ELSD), and gas chromatography (GC) with a flame ionisation detector (FID) and a mass analyser (MS). The course covers the construction of the equipment, sample preparation, the separation of analytes, chromogram analysis and the processing and interpretation of results.
Didactic form, number of hours:	10 hours
Teaching methods:	Lecture, laboratory exercises, experience, experiment, discussion, problem solving
Limit of people in the group:	15

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:	Laboratory exercise reports, evaluation credit sheets
Elements and weights of the final grade:	Final assessment: The evaluation of learning outcomes consists of the following: 1) reports on laboratory exercises and 2) a test. A maximum of 100 points can be obtained for each element. Weights of each element: 1 – 50%, 2 – 50%. The final grade is the sum of the points obtained for each element, taking into account its weighting. A minimum score of 51% is required to pass.
Place of the course:	Teaching room, laboratory

Basic and supplementary literature

Basic literature:
1. S. Fanali, B. Chankvetadze, P. R. Haddad, C. Poole and M. J. Riekkola. Liquid Chromatography: Fundamentals and Instrumentation, 3rd edition. Elsevier, 2023.
2. D. C. Turner, M. Schäfer, S. Lancaster, I. Janmohamed, A. Gachanja and J. Creasey, Gas Chromatography-Mass Spectrometry: How Do I Get the Best Results? The Royal Society of Chemistry, 2019.
3. L. R. Snyder, J. J. Kirkland, and J. W. Dolan, Introduction to Modern Liquid Chromatography. John Wiley & Sons, Inc., 2010.
Supplementary literature:
1. M. Holčapek and W. C. Byrdwell, Handbook of Advanced Chromatography/Mass Spectrometry Techniques. Academic Press and AOCS Press, 2017.
2. E. Bulska, Metrology in Chemistry. Springer, 2018.
3. M. Dong, HPLC and UHPLC for Practising Scientists. John Wiley & Sons, Inc. 4. Specialist websites, 2019.
5. Manufacturers' and suppliers' materials.

Comments:	

Estimated number of hours of work of the doctoral student necessary to achieve the assumed learning outcomes:	10

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