AGH UNIVERSITY OF SCIENCE AND TECHNOLOGY

Module name: Modern analytical techniques in biosciences

Academic year: 2019/2020 Code: ZSDA-3-0097-s ECTS credits: 2

Faculty of: Szkoła Doktorska AGH

Field of study: Szkoła Doktorska AGH Specialty: —

Study level: Third-cycle studies Form and type of study: Full-time studies

Lecture language: English Profile of education: Academic (A) Semester: 0

Course homepage: —

Responsible teacher: dr hab. Smoluch Marek (smoluch@agh.edu.pl)

Module summary

Students will gain advanced practical knowledge on on applications of separation techniques and mass spectrometry in biosciences.

Description of learning outcomes for module

MLO code	Student after module completion has the knowledge/ knows how to/is able to	Connections with FLO	Method of learning outcomes verification (form of completion)
Social competence: is able to			
M_K001	Student can critically decide what tools should be used to solve particular research problem	SDA3A_K01	Activity during classes
Skills: he can			
M_U001	Student can select proper separation strategy to analyze and identify typical compounds	SDA3A_U01	Execution of laboratory classes, Test, Activity during classes
M_U002	Student is able to interpret data obtained by analytical techniques useful in biosciences	SDA3A_U06	Execution of laboratory classes, Activity during classes
Knowledge: he knows and understands			
M_W001	Student understands basics of analytical methods applied in biosciences	SDA3A_W01	Test, Activity during classes

Number of hours for each form of classes

	Form of classes										
Suma	Lectures	Auditorium classes	Laboratory classes	Project classes	Conversation seminar	Seminar classes	Practical classes	Fieldwork classes	Workshops	Prace kontrolne i przejściowe	Lektorat
20	10	0	10	0	0	0	0	0	0	0	0

FLO matrix in relation to forms of classes

MLO code	Student after module completion has the knowledge/ knows how to/is able to	Form of classes										
		Lectures	Auditorium classes	Laboratory classes	Project classes	Conversation seminar	Seminar classes	Practical classes	Fieldwork classes	Workshops	Prace kontrolne i przejściowe	Lektorat
Social competence: is able to												
M_K001	Student can critically decide what tools should be used to solve particular research problem	-	-	+	-	-	-	-	-	-	-	-
Skills: he can												
M_U001	Student can select proper separation strategy to analyze and identify typical compounds	+	-	+	-	-	-	-	-	-	-	-
M_U002	Student is able to interpret data obtained by analytical techniques useful in biosciences	+	-	+	-	-	-	-	-	-	-	-
Knowledge: he knows and understands												
M_W001	Student understands basics of analytical methods applied in biosciences	+	-	-	-	-	-	-	-	-	-	-

Student workload (ECTS credits balance)

Student activity form	Student workload
Udział w zajęciach dydaktycznych/praktyka	20 h
Preparation for classes	10 h
przygotowanie projektu, prezentacji, pracy pisemnej, sprawozdania	10 h
Realization of independently performed tasks	10 h
Examination or Final test	1 h
Summary student workload	51 h
Module ECTS credits	2 ECTS

Additional information

Module content

Lectures

1. Overview of analytical methods applied in biosciences
2. Introduction to chromatographic and electrophoretic separations.
3.Mass spectrometry as a powerful technique for illegal drugs detection
4. Hyphenated techniques for the analysis of complex biological samples.
5. Detailed analysis of the human material – proteomics.

Laboratory classes

1. TLC – fast identification of psychoactive compounds.
2. Basic maintenance of instrumentation.
3.Mass spectrometry of drugs, psychoactive compounds, and other molecules.
4. Sample handling.
5. Hyphenated techniques – applications in proteomics.

Teaching methods and techniques:

Lectures: The topics presented in the lecture are shown in the form of a multimedia presentation
Laboratory classes: Students carry out a laboratories by themselves, consulting the encountered problems with the teacher.

Warunki i sposób zaliczenia poszczególnych form zajęć, w tym zasady zaliczeń poprawkowych, a także warunki dopuszczenia do egzaminu:

Nie określono

Zasady udziału w poszczególnych zajęciach, ze wskazaniem, czy obecność studenta na zajęciach jest obowiązkowa:

Lectures:
– Attendance is mandatory: Yes
– Participation rules in classes: Nie określono
Laboratory classes:
– Attendance is mandatory: Yes
– Participation rules in classes: Nie określono

Method of calculating the final grade
50% – laboratories grade (including laboratory report)
50% – test grade (from lectures)
Further details will be given during the first meeting.

Sposób i tryb wyrównywania zaległości powstałych wskutek nieobecności studenta na zajęciach:
Set up individually for each case

Prerequisites and additional requirements
Basic knowledge of chemistry

Recommended literature and teaching resources
Recommended literature and teaching resources not specified

Scientific publications of module course instructors related to the topic of the module
Additional scientific publications not specified

Additional information
The course starts in the academic year 2020/21