KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY

Course title	ECTS code
Monographic lecture - Lipid analysis	13.3.1031

Name of unit administrating study

null

Studies

faculty	field of study		
Wydział Chemii	Biznes chemiczny	type	drugiego stopnia
		form	stacjonarne
		specialty	wszystkie
		specialization	wszystkie

Teaching staff

dr hab. Łukasz Haliński; dr hab. Marek Gołębiowski, profesor uczelni

Forms of classes, the realization and number of hours

Forms of classes

Lecture

The realization of activities

classroom instruction

Number of hours

Lecture: 30 hours

ECTS credits

3
classes 30 h
Tutorial classes 10 h
Student's own work 35 h
TOTAL: 75 h - 3 ECTS

The academic cycle

2023/2024 summer semester

Type of course

obligatory

Language of instruction

polish

Teaching methods

multimedia-based lecture

Form and method of assessment and basic criteria for eveluation or examination requirements

Final evaluation

Graded credit

Assessment methods

- (mid-term / end-term) test
- graded course credit based on individual grades obtained during the semester

The basic criteria for evaluation

Lecture:

• pass tests with open and closed questions; the final score from the results of both tests gives the following grade:

91-100%: 5.0
81-90%: 4.5
71-80%: 4.0
61-70%: 3.5
51-60%: 3.0
Less than 51% 2.0

Method of verifying required learning outcomes

Required courses and introductory requirements

A. Formal requirements

none

B. Prerequisites

none

Aims of education

Aims of education
• To provide students a clear understanding of basic issues in lipid chemistry and analysis
• To familiarize students with lipid chemistry, nomenclature and properties
• To familiarize students with the theory and practice of lipid extraction, purification, fractionation and chemical analysis
• To introduce students to principles of designing the analytical process basing on the structure and properties of certain lipid classes
• To learn students how to independently design simple analytical process

Course contents

Course contents
The course includes principles of the modern qualitative and quantitative analysis of lipids, with the special attention paid to determination of fatty acids, triacylglycerols and phospholipids. Specified topics of lectures are given below.
Introduction to lipid chemistry (definitions, chemical structure and nomenclature of non-polar and polar lipids). Sample preparation and lipid extraction. Fractionation of lipids using chromatographic techniques (TLC, LC, HPLC, SPE). Fractionation and analysis of lipids using HPLC. Detectors used in HPLC analysis of lipids (spectrophotometric/UV, IR, refractive index detector, light scattering detector, CAD). Gas chromatography: columns, stationary phases, injectors and detectors (FID, IR, MS) used in lipid analysis. Mass spectrometry of lipids (GC-MS, LC-MS, MALDI-TOF/MS techniques). Interpretation of mass spectra of selected lipids. Usefulness of coupled analytical techniques. Applications of instrumental techniques for the analysis of selected lipid classes. Extraction of lipids from certain organisms: special cases. Lipids as markers of selected human disorders.

Bibliography of literature

Bibliography of literature
Literature required to pass the course
A.1. Literature used during classes:
• Christie W.W. Gas chromatography and lipids. The Oily Press, Wielka Brytania, dostępne on-line: http://lipidlibrary.aocs.org/ , przeglądane 2012-01-20
• Hamilton R.J., Hamilton S. Lipid Analysis. A Practical Approach. IRL Press, Wielka Brytania.
• Gunstone F.D., Harwood J.L., Padley F.B. The Lipid Handbook. Chapman & Hall, Wielka Brytania.
A.2. Literature for individual studies:
• Stepnowski P., Synak E., Szafranek B., Kaczyński Z. Techniki separacyjne. Wydawnictwo UG, 2010.
• Kocjan R. (red.). Chemia analityczna. Podręcznik dla studentów. Wydawnictwo Lekarskie PZWL, Warszawa, 2000, Tom 2.
• Szczepaniak W. Metody instrumentalne w analizie chemicznej. Wydawnictwo Naukowe PWN, Warszawa, 1996.
Extracurricular readings

• scientific articles concerning course contents

The learning outcomes (for the field of study and specialization)	Knowledge
	Skills
	Social competence

Contact

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