


KAPITAŁ LUDZKI
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez
 Unię Europejską w ramach
 Europejskiego Funduszu
 Społecznego

UNIA EUROPEJSKA
 EUROPEJSKI
 FUNDUSZ SPOŁECZNY


Course title		ECTS code	
Fluorescence spectroscopy for beginners		13.3.1206	
Name of unit administrating study			
Faculty of Chemistry			
Studies			
faculty	field of study	type	pierwszego stopnia
Wydział Chemii	Biznes chemiczny	form	stacjonarne
		specjalty	wszystkie
		specialization	wszystkie
Wydział Chemii	Chemia	type	pierwszego stopnia
		form	stacjonarne
		specjalty	chemia biomedyczna, chemia kosmetyków, analityka i diagnostyka chemiczna, chemia żywności
Wydział Chemii	Ochrona środowiska	specialization	wszystkie
		type	pierwszego stopnia
		form	stacjonarne
		specjalty	wszystkie
		specialization	wszystkie
Teaching staff			
dr inż. Krzysztof Żamojć			
Forms of classes, the realization and number of hours		ECTS credits	
Forms of classes		2 classes - 15 h tutorial classes - 15 h student's own work - 20 h TOTAL: 50 h - 2 ECTS	
Laboratory classes			
The realization of activities			
classroom instruction			
Number of hours			
Laboratory classes: 15 hours			
The academic cycle			
2025/2026 summer semester			
Type of course		Language of instruction	
an elective course		English	
Teaching methods		Form and method of assessment and basic criteria for evaluation or examination requirements	
chemical experiments, analysis of obtained results and discussion.		Final evaluation	
		Graded credit	
		Assessment methods	
		- ssignment work – conducting research and presenting results - graded course credit based on individual grades obtained during the semester	
		The basic criteria for evaluation	
		Laboratory classes: a positive note from all short tests and reports; final note is an average from notes from tests and reports:	
		91-100%: 5.0	
		81-90%: 4.5	
		71-80%: 4.0	
		61-70%: 3.5	
		51-60%: 3.0	
		< 51%: 2.0	
Method of verifying required learning outcomes			

The method of verifying the acquisition of knowledge:

During the laboratory exercises, the student solves problems in writing (short tests, reports) or oral (oral answer) in the field of fluorescence spectroscopy.

The method of verifying the acquisition of skills:

Assessment of the student's involvement in discussions on the issues related to the subject. Assessment of independent conducting of chemical experiments by the student. Assessment of the Student's explanation of the course of chemical experiments, assessment of the correctness of the analysis of the results, drawing conclusions from the experiments and preparation of reports.

The method of verifying the acquisition of social competences:

Assessment of the student's ability to solve scientific and research problems on the basis of individual and team work.

Required courses and introductory requirements

A. Formal requirements

lack

B. Prerequisites

lack

Aims of education

Familiarize students with the basic aspects of fluorescence spectroscopy.

Familiarize students with the use of spectrofluorometer

Course contents

Topics of laboratory classes: spectrofluorometer operation; basic definitions and laws related with fluorescence spectroscopy; registration of absorption, fluorescence excitation and emission spectra; determination of fluorescence quantum yields; the studies of the influence of solvent's polarity on the fluorescence emission spectra; quantitative determination of the selected fluorophores

Bibliography of literature

J.R. Lakowicz – Principles of fluorescence spectroscopy

B. Valeur – Molecular fluorescence

The learning outcomes (for the field of study and specialization)

Chemical Business:

K_BCh_W07

describes the construction and operating principles of scientific, technological and control-measuring apparatus

K_BCh_W10

knows and understands safety and hygiene principles when working on a test and measurement stand or in the field

K_BCh_U03

plans, selects the appropriate research and measuring equipment and performs chemical experiments; analyses the results and draws conclusions based on them

K_BCh_U09

using the acquired knowledge, skills and various sources of scientific information independently prepares written papers and oral presentations

K_BCh_K03

independently sets or implements a set action plan specifying priorities for its implementation

Chemistry:

K_W10

enumerates and describes the aspects of the construction, operation and use of measuring apparatus and equipment used in experimental works in the field of chemistry and related sciences

K_W12

characterises the principles of health and safety at work in a chemical laboratory; knows and describes the hazards associated with working with hazardous substances, ways to counteract these hazards and rules of conduct during an accident

K_U04

Knowledge

Students: know and interpret types of electronic transitions as well as basic definitions and laws related with fluorescence spectroscopy; know differences and similarities between absorption, excitation and emission spectra; know the build of spectrofluorometer; define the influence of solvent's polarity on the fluorescence emission spectra, know how to determine the concentration of a fluorophore

Skills

Students: present plainly – in both speech and writing – correct chemical argumentation, interpret and analyze information connected with fluorescence spectroscopy presented as text, tables, plots, schemes, figures, can use spectrofluorometer, can register absorption, fluorescence excitation and emission spectra; can experimentally determine fluorescence quantum yields and the influence of solvent's polarity on the fluorescence emission spectra; can interpret information, formulate conclusions and explain opinions; can determine the concentration of a fluorophore with the use of fluorescence spectroscopy.

Social competence

Students: understand need for learning, inspire other for learning; cooperate in group, taking different roles; exhibit creativity in determination of priorities necessary for realization of different tasks; understand social aspects of practical use of knowledge and abilities as well as connected with them responsibility.

<p>plans and performs chemical experiments and analyses the results obtained</p> <p>K_U07</p> <p>prepares documented elaboration on a specific problem in the field of selected chemical and physical issues</p> <p>K_K02</p> <p>works individually demonstrating initiative and independence of activity and cooperates in a team fulfilling various roles in it</p> <p>Environmental Protection:</p> <p>K_OŚI_W13</p> <p>defines the basic principles of occupational safety, ergonomics and hygiene</p> <p>K_OŚI_U02</p> <p>plans, selects appropriate research and measuring equipment and devices, performs physicochemical measurements and experiments; analyses the results and draws conclusions based on them</p> <p>K_OŚI_U09</p> <p>prepares in Polish/English a short description of research, observation or problem task carried out during classes using appropriate scientific terminology</p> <p>K_OŚI_K02</p> <p>works individually demonstrating initiative and independence in actions, and effectively cooperates in a team, performing various roles in it</p> <p>K_OŚI_K08</p> <p>is responsible for and takes care of the specialist equipment entrusted to her/him for research and laboratory or field work</p>	
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