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		
Faculty of Chemistry	Chemical Business	type	first tier studies (BA)
		form	full-time
		specialty	all
		specialization	all
Faculty of Chemistry	Chemistry	type	first tier studies (BA)
		form	full-time
		specialty	all
		specialization	all
Faculty of Chemistry	Environmental Protection	type	first tier studies (BA)
		form	full-time
		specialty	all
		specialization	all

Teaching staff

dr inż. Krzysztof Żamojć

Forms of classes, the realization and number of hours

Forms of classes

Laboratory classes

The realization of activities

classroom instruction

Number of hours

Laboratory classes: 15 hours

ECTS credits

2
classes - 15 h
tutorial classes - 15 h
student's own work - 20 h
TOTAL: 50 h - 2 ECTS

The academic cycle

2024/2025 summer semester

Type of course

an elective course

Language of instruction

english

Teaching methods

chemical experiments, analysis of obtained results and discussion.

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

Final evaluation

Graded credit

Assessment methods

reports and short tests

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

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
plans and performs chemical experiments and analyses the results obtained
K_U07
prepares documented elaboration on a specific problem in the field of selected chemical and physical issues
K_K02
works individually demonstrating initiative and independence of activity and cooperates in a team fulfilling various roles in it
Environmental Protection:
K_OŚI_W13
defines the basic principles of occupational safety,

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.

ergonomics and hygiene K_OŚI_U02 plans, selects appropriate research and measuring equipment and devices, performs physicochemical measurements and experiments; analyses the results and draws conclusions based on them K_OŚI_U09 prepares in Polish/English a short description of research, observation or problem task carried out during classes using appropriate scientific terminology K_OŚI_K02 works individually demonstrating initiative and independence in actions, and effectively cooperates in a team, performing various roles in it K_OŚI_K08 is responsible for and takes care of the specialist equipment entrusted to her/him for research and laboratory or field work	

Contact

krzysztof.zamojc@ug.edu.pl