University of Gdańsk

Subject card

Subject name and code	Principles and applications of fluorescence spectroscopy, PG_00050888		
Field of study	Chemical Business, Chemistry, Environmental Protection		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
Education level	Master's studies	Subject group	Optional subject group
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	English
Semester of study	3	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
Conducting unit	Faculty of Chemistry -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Krzysztof Żamojć	
	Teachers		

Lesson types							
	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	E-learning hours included: 0.0						

Learning activity and number of study hours					
	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	15	2.0	33.0	50

Subject objectives	Familiarize students with the basic and more advanced aspects of fluorescence spectroscopy. Familiarize students with the use of spectrofluorometer.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEMMU2_W01] Uses knowledge of spectroscopic methods of chemical compound analysis.	Students: know and interpret main photophysical processes in ground and excited states as well as basic definitions and laws related with fluorescence spectroscopy; define types of electronic transitions; know differences and similarities between absorption, excitation and emission spectra; know the definitions and main mechanisms of fluorescence quenching; know main qualitative and quantitative methods of the studies of mechanisms or reactions; know the build of spectrofluorometer; define various factors which have an influence on the fluorescence emission spectra.	[SW4] test/exam - oral or written
	[CHEMMU2_U04] Applies acquired knowledge of chemistry and related scientific disciplines.	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 experimentally determine the mechanism of fluorescence quenching, aggregation number, cmc and hydrophobicity of the surfactants' micelles, can determine the influence of various factors on the fluorescence emission spectra as well as the stoichiometry and association constants of complexes, interpret information, formulate conclusions and explain opinions.	[SU4] test/exam - oral or written
	[CHEMMU2_U01] Plans and implements chemical experiments of medium complexity.	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 experimentally determine the mechanism of fluorescence quenching, aggregation number, cmc and hydrophobicity of the surfactants' micelles, can determine the influence of various factors on the fluorescence emission spectra as well as the stoichiometry and association constants of complexes, interpret information, formulate conclusions and explain opinions.	[SU4] test/exam - oral or written
	[CHEMMU2_U02] Critically assesses the results of conducted, performed observations and theoretical calculations and discusses errors.	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 experimentally determine the mechanism of fluorescence quenching, aggregation number, cmc and hydrophobicity of the surfactants' micelles, can determine the influence of various factors on the fluorescence emission spectra as well as the stoichiometry and association constants of complexes, interpret information, formulate conclusions and explain opinions.	[SU4] test/exam - oral or written

Subject contents	Absorption of the light; ground and excited states; types of electronic transitions; absorption, excitation, and emission spectra; photophysical processes in the excited state; fluorescence quenching; the studies of the mechanisms of reactions - qualitative and quantitative methods; instrumentation.
Prerequisites and co-requisites	
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
Written test	51.0%	100.0%

Recommended reading	Basic literature	B. Valeur Molecular fluorescence
	Supplementary literature	J.R. Lakowicz Principles of fluorescence spectroscopy
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

Document generated electronically. Does not require a seal or signature.