University of Gdańsk

Subject card

Subject name and code	Fluorescence spectroscopy for beginners, PG_00080770						
Field of study	Chemical Business, Chemistry, Environmental Protection						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2027/2028		
Education level	Bachelor's studies		Subject group		Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		English		
Semester of study	6		ECTS credits		2.0		
Learning profile	academic		Assessment form				
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	0.0	0.0	15.0	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 aspects of fluorescence spectroscopy. Familiarize students with the use of spectrofluorometer.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEML3_U07] Prepares documented elaboration on a specific problem in the field of selected chemical and physical issues.	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.	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written
	[CHEML3_K02] Works individually demonstrating initiative and independence of activity and cooperates in a team fulfilling various roles in it.	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.	[SK2] presentation/project/paper/ report [SK4] test/exam - oral or written
	[CHEML3_U04] Plans and performs simple chemical experiments and analyses the results obtained.	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.	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written
	[CHEML3_W12] Characterises the basic 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.	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 and absorption spectra, know how to determine the concentration of a fluorophore and its quantum yield.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report

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<tr><th>Course outcome</th><th>Subject outcome</th><th>Method of verification</th></tr>
<tr><td>[CHEML3_W10] Enumerates and describes the basic aspects of the construction, operation and use of measuring apparatus and equipment used in experimental works in the field of chemistry and related sciences.</td><td>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 and absorption spectra, know how to determine the concentration of a fluorophore and its quantum yield.</td><td>[SW4] test/exam - oral or written
[SW2] presentation/project/paper/ report</td></tr>
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<tr><td>Subject contents</td><td>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.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Written test</td><td>51.0%</td><td>75.0%</td></tr>
<tr><td>Laboratory report</td><td>51.0%</td><td>25.0%</td></tr>
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<tr><td>Recommended reading</td><td>
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<tr><td>Basic literature</td><td>1. J.R. Lakowicz Principles of fluorescence spectroscopy
2. B. Valeur, Molecular fluorescence
3. Z. Kęcki, Podstawy spktroskopii molekularnej</td></tr>
<tr><td>Supplementary literature</td><td>Not applicable.</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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