

Subject card

Subject name and code	Fluorescence spectroscopy in a quality control, PG_00080758						
Field of study	Chemical Business						
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		Polish		
Semester of study	6		ECTS credits		1.0		
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		8.0	25
Subject objectives	Consolidation of basic theoretical knowledge in the field of fluorescence spectroscopy. Familiarity with important quality control issues. Developing the skills of independent experimentation and interpretation of the results obtained and solving problems while conducting a chemical experiment.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BCHINŻ_K02] Works individually demonstrating initiative and independence in actions, and effectively cooperates in a team, performing various roles in it.	He applies the rules of safety and hygiene while working at the research and measurement stand. He is convinced of the importance of understanding the relationships between the knowledge acquired during classes and the phenomena and problems he knows from his direct experience and general knowledge of the modern world. Works individually, showing initiative and independence in activities, and works effectively in a team.	[SK2] presentation/project/paper/report [SK4] test/exam - oral or written
	[BCHINŻ_U09] Using the acquired knowledge, skills and various sources of scientific information independently prepares written papers and oral presentations.	Student can operate a spectrofluorimeter and UV-Vis spectrophotometer. He can register absorption and fluorescence emission spectra. He can prepare a calibration curve as a dependence of fluorescence intensity (absorbance) as a function of fluorescent substance concentration. Analyzes the results and draws conclusions based on them.	[SU2] presentation/project/paper/report [SU4] test/exam - oral or written
	[BCHINŻ_W10] Applies safety and hygiene principles when working on a test and measurement stand or in the field.	Student knows the structure and principle of operation of the spectrofluorimeter and UV-Vis spectrophotometer. He knows the basic concepts of fluorescence spectroscopy. He understands the calibration curve method (as an example of a comparative method of analytical measurement).	[SW4] test/exam - oral or written [SW2] presentation/project/paper/report
	[BCHINŻ_U02] Uses basic methods, techniques and tools in formulating and solving engineering tasks in the field of chemistry.	Student can operate a spectrofluorimeter and UV-Vis spectrophotometer. He can register absorption and fluorescence emission spectra. He can prepare a calibration curve as a dependence of fluorescence intensity (absorbance) as a function of fluorescent substance concentration. Analyzes the results and draws conclusions based on them.	[SU2] presentation/project/paper/report [SU4] test/exam - oral or written
	[BCHINŻ_U05] Evaluates the usefulness and functioning of existing engineering and technical solutions as well as research and measurement methods in the chemical industry.	Student can operate a spectrofluorimeter and UV-Vis spectrophotometer. He can register absorption and fluorescence emission spectra. He can prepare a calibration curve as a dependence of fluorescence intensity (absorbance) as a function of fluorescent substance concentration. Analyzes the results and draws conclusions based on them.	[SU2] presentation/project/paper/report [SU4] test/exam - oral or written
	[BCHINŻ_U03] Plans, selects the appropriate research and measuring equipment and performs simple chemical experiments; analyses the results and draws conclusions based on them.	Student can operate a spectrofluorimeter and UV-Vis spectrophotometer. He can register absorption and fluorescence emission spectra. He can prepare a calibration curve as a dependence of fluorescence intensity (absorbance) as a function of fluorescent substance concentration. Analyzes the results and draws conclusions based on them.	[SU2] presentation/project/paper/report [SU4] test/exam - oral or written

	Course outcome	Subject outcome	Method of verification
	[BCHINŻ_K03] Independently sets or implements a set action plan specifying priorities for its implementation; critically assesses its progress.	He applies the rules of safety and hygiene while working at the research and measurement stand. He is convinced of the importance of understanding the relationships between the knowledge acquired during classes and the phenomena and problems he knows from his direct experience and general knowledge of the modern world. Works individually, showing initiative and independence in activities, and works effectively in a team.	[SK2] presentation/project/paper/report [SK4] test/exam - oral or written
Subject contents	Construction and principle of operation of the spectrofluorimeter and UV-Vis spectrophotometer. Determining the basic parameters necessary for the quantitative determination of the test substance (e.g. excitation wavelength, emission wavelength, the slits, the allowed concentration range of the test substance). Preparation of the standard curves (dependence of fluorescence intensity and absorbance as a function of fluorescent substance concentration). Quantitative determination of a selected substance contained in a food product using a previously prepared standard curves.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written test	51.0%	75.0%
	Laboratory report	51.0%	25.0%
Recommended reading	Basic literature	J.A. Barltrop, J.D. Coyle, Fotochemia - podstawy.	
	Supplementary literature	J. Lakowicz, Principles of Fluorescence Spectroscopy	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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