University of Gdańsk

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 2024		Academic year of realisation of subject	2026/2027			
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	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	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_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
	[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
	[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_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_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_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

<table>
<tr><td></td><td>
<table>
<tr><th>Course outcome</th><th>Subject outcome</th><th>Method of verification</th></tr>
<tr><td>[BCHINŻ_K02] Works individually demonstrating initiative and independence in actions, and effectively cooperates in a team, performing various roles in it.</td><td>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.</td><td>[SK2] presentation/project/paper/ report
[SK4] test/exam - oral or written</td></tr>
</table>
</td></tr>
<tr><td>Subject contents</td><td>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.</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>Laboratory report</td><td>51.0%</td><td>25.0%</td></tr>
<tr><td>Written test</td><td>51.0%</td><td>75.0%</td></tr>
</table>
</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>J.A. Barltrop, J.D. Coyle, Fotochemia - podstawy.</td></tr>
<tr><td>Supplementary literature</td><td>J. Lakowicz, Principles of Fluorescence Spectroscopy</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table>
</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
</table>

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