University of Gdańsk

Subject card

Subject name and code	DNA Analyses in Forensics, PG_00188349						
Field of study	Forensic Analytics						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2028/2029			
Education level	Bachelor's studies		Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study			
Mode of study	full-time studies		Mode of delivery	at the university			
Year of study	3		Language of instruction	Polish			
Semester of study	5		ECTS credits	2.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Laboratory of Biological Sensitizers -> Department of Physical Chemistry -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Magdalena Zdrowowicz-Żamojć				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	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	30		5.0	15.0		50
Subject objectives	The aim of the course is to provide students with practical experience in the basic DNA analysis methods used in modern forensic science.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[AKRL3_K04] The graduate is ready to cooperate with representatives of other fields—law, medicine, biology—within forensic expertise.	The student knows the principles of interpreting DNA analysis results in a manner that allows them to be appropriately presented to specialists from various scientific fields and forensic practice. The student has knowledge of the standards for reporting results in genetic expertises, in accordance with the requirements of legal and medical institutions. The student is prepared to communicate and collaborate with experts in law, medicine, and biology to ensure a reliable and objective assessment of evidentiary material. The student is able to formulate conclusions from DNA analyses in a way that is understandable to specialists outside biological laboratories, including forensic experts, physicians, and lawyers.	[SK1] oral statement/conversation/ discussion [SK2] presentation/project/paper/ report
	[AKRL3_K02] The graduate is ready to make reliable, objective decisions and take responsibility for the interpretation of research results.	The student is able to interpret the results of DNA analyses (PCR, native and denaturing electrophoresis, real-time PCR, sequencing, HPLC, MS). The student is aware of the responsibility associated with interpreting DNA results and making decisions based on scientific data. The student is able to apply procedures that ensure the reliability of research results, including preventing sample contamination and verifying data quality.	[SK1] oral statement/conversation/ discussion [SK2] presentation/project/paper/ report
	[AKRL3_K06] The graduate is ready to follow occupational health and safety regulations in the laboratory and care for the safety of themselves and others.	The student is able to perform analyses in an instrument-based laboratory and understands as well as applies the principles of working with nucleic acids, including procedures for preventing contamination of the examined material.	[SK2] presentation/project/paper/ report
	[AKRL3_U03] The graduate is able to perform analyses using instrumental methods (spectroscopy, chromatography, microbiological tests) and interpret research results.	The student is able to perform oligonucleotide analysis using ion-pair chromatography as well as mass spectrometry (MS).	[SU2] presentation/project/paper/ report
	[AKRL3_W06] The graduate knows and understands the principles of statistical processing of measurement data and the basics of chemometrics and validation of analytical methods.	The student knows the basic methods of statistical processing of biological data. The student is able to apply statistical tools to analyze DNA research results and interpret their significance in the context of forensic expertise. The student is aware of the importance of reliable data processing and method validation for the credibility of DNA analysis results in a forensic context.	[SW2] presentation/project/paper/ report
	[AKRL3_U10] The graduate is able to interpret data from different analytical techniques to reconstruct events or identify evidence material.	The student is capable of interpreting DNA analysis data for the purpose of evidentiary material identification within forensic investigations.	[SU2] presentation/project/paper/ report

<table>
<tr><td>Subject contents</td><td>DNA extraction from biological materials.

Assessment of the quality and quantity of isolated DNA.

Comparison of the efficiency of different DNA extraction methods.

Preparation of PCR and real-time PCR reactions.

Agarose and polyacrylamide gel electrophoresis.

Oligonucleotide analysis using HPLC and mass spectrometry (MS).</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></td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>1. Fundamentals of Forensic DNA Typing JohnM.Butler

2. Advanced Topics in Forensic DNA Typing: Methodology JohnM.Butler</td></tr><tr><td>Supplementary literature</td><td>1. Forensic DNA Analysis: Methods and Protocols (Methods in Molecular Biology, 2023)</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>electrophoretic separations, PCR primer design, DNA extraction</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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