

Subject card

Subject name and code	Mechanoscopy and physical methods of examining traces - laboratory classes, PG_00132720						
Field of study	Criminology						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2024/2025		
Education level	Master's studies	Subject group			Obligatory subject group in the field of study		
Mode of study	full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			1.0		
Learning profile	academic	Assessment form			credit		
Conducting unit	Faculty of Law and Administration -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Anna Synak				
	Teachers		dr hab. Anna Synak mgr Agnieszka Schlichtholz				
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		0.0		10.0	25
Subject objectives	Familiarization with the aparatures used in modern forensics to identify traces, mainly in the investigative technique of mechanoscopy. Familiarization with its possibilities and limitations from the perspective of its use in the preparation of an expert opinion. Acquisition of basic skills: a) performing research based on microscopic and X-ray techniques b) preliminary analysis and interpretation of measurement data c) a their presentation and assessment of usefulness. Learning basic physical phenomena and processes necessary to understand the discussed research methods and the equipment used						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[KRYMMU2_UW02] He/she acquires knowledge independently and develops his/her professional skills using various sources (in native and foreign language) and modern technologies	Student: 1. has the ability to prepare various materials, appropriate presentation of results. 2. acquire and use knowledge from various disciplines in order to develop their skills, 3. use various sources of knowledge in order to solve specific problems	[SU3] text preparation/written work
	[KRYMMU2_UW06] He/she is able to propose solutions of concrete problems and carry out procedures connected with solutions in this respect	Student is able to: 1. match a specific research method to a given evidence, 2. match a specific research method to a specific need (e.g. in an expert opinion assignment). 3. has the ability to prepare various materials and present results appropriately.	[SU1] oral statement/conversation/discussion
	[KRYMMU2_KR08] He/ she is aware of the level of own knowledge and skills, and understands the need for lifelong learning	1. The student knows the limitations of his/her own knowledge of physics (its laws, achievements and applications); 2. The student understands the need for further education and training of skills; 3. The student appreciates the development made in forensics thanks to its connection with the sciences sciences and scientific analysis of crime evidence; 4. The student is aware of the helpful role of physicochemical analysis of traces in identifying perpetrators of crimes; 5. The student is aware of the prospects for the development of forensics along with the development of the exact sciences.	[SK1] oral statement/conversation/discussion
	[KRYMMU2_KK01] The graduate is aware of the level of his/her knowledge and skills, and also understands the need of lifelong learning	1. The student knows the limitations of his/her own knowledge of physics (its laws, achievements and applications); 2. The student understands the need for further education and training of skills; 3. The student appreciates the development made in forensics thanks to its connection with the sciences sciences and scientific analysis of crime evidence; 4. The student is aware of the helpful role of physicochemical analysis of traces in identifying perpetrators of crimes; 5. The student is aware of the prospects for the development of forensics along with the development of the exact sciences.	[SK8] observation of student's independent or team work
	[KRYMMU2_UW07] He/she has skills in understanding and analyzing social phenomena and utilizing the analysis in professional work	Student 1. is able to properly determine priorities for the implementation of a task specified by himself or others and translate it into specific actions. 2. understands the need for lifelong learning, 3. uses general knowledge of criminology (mechnanoscopy) while maintaining the ethical principles appropriate to his profession, 4. can work in interdisciplinary groups, 5. can communicate in an accessible and understandable way with people from various social and professional groups.	[SU8] observation of student's independent or team work
Subject contents	Optical and electron microscopy (with extension to scanning electron microscope SEM), physical methods of glass testing (refractive index), metallographic methods, X-ray methods.		

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written report	51.0%	50.0%
	oral/ written answer	51.0%	50.0%
Recommended reading	Basic literature	<p>[1] K. Sikorski, A. Szumner - Podstawy ilościowej mikroanalizy rentgenowskiej". Wydawnictwo Naukowo - Techniczne, Warszawa 1994</p> <p>[2] A. Barbacki, Mikroskopia elektronowa, Wyd. Politechniki Poznańskiej, 2005</p> <p>[3] J.A.Litwin, M. Gajda, Podstawy technik mikroskopowych, Wydawnictwo Uniwersytetu Jagiellońskiego, 2011</p> <p>[4] J. Widacki - Kryminalistyka" , Wydawnictwo C.H. Beck, 2012</p> <p>[5] A. Filewicz, W. Krawczyk, A. Musiał - Ślady fizykochemiczne. Ślady kryminalistyczne. Ujawnianie, zabezpieczenie, wykorzystanie" pod redakcjąM. Goca i J. Moszczyńskiego, Diffin, Warszawa 2007.</p> <p>[6]J. R. Taylor, Wstęp do analizy błędu pomiarowego, Wydawnictwo Naukowe PWN, Warszawa 1995</p>	
	Supplementary literature	<p>[1] M. Pluta, Mikroskopia optyczna, PWN, Warszawa, 1980.</p> <p>[2] D. Halliday, R. Resnick, J. Walker, Podstawy fizyki, t. 4, PWN, 2012.</p> <p>[3]D.B. Murphy, Fundamentals of Light Microscopy and Imaging, John Wiley and Sons, 2001r</p> <p>[4] I. Sołtyszewski, P. Polak - Badania kryminalistyczne", Wydawnictwo UMW, Olsztyn 2007;</p> <p>[5] Springer Handbook of Microscopy</p>	
	eResources addresses	<p>Basic</p> <p>http://www.olympusmicro.com/A - Olympus microscopy</p> <p>https://www.microscopyu.com/ - Nikon microscopy</p>	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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