

**Subject card**

<b>Subject name and code</b>	Mechanoscopy and physical methods of examining traces - laboratory classes, PG_00132720						
<b>Field of study</b>	Criminology						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>			2026/2027		
<b>Education level</b>	Master's studies	<b>Subject group</b>			Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	1	<b>Language of instruction</b>			Polish		
<b>Semester of study</b>	2	<b>ECTS credits</b>			1.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>			credit		
<b>Conducting unit</b>	Faculty of Law and Administration -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr hab. Anna Synak				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	0.0	0.0	15.0	0.0	0.0	15
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	15		0.0		10.0	25
<b>Subject objectives</b>	Familiarization with the apparatuses 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_K05] Is able to independently and critically complement knowledge and skills, extended by the interdisciplinary dimension	The student is able to expand their knowledge and skills in various fields of science related to physical methods of examining traces of crimes. Verifies the credibility of information obtained from various sources based on basic knowledge of physics.	[SK1] oral statement/conversation/discussion
	[KRYMMU2_UW01] I able to apply theoretical knowledge of criminology and related disciplines to analyse and interpret problems in criminology in a broad sense	The student is able to use knowledge of criminology and physics to propose solutions and interpret specific problems. Is able to use the knowledge acquired to determine the direction of further education. Is able to analyze the results of their own research and that of other specialists.	[SU1] oral statement/conversation/discussion [SU3] text preparation/written work
	[KRYMMU2_UW02] Is able to acquire knowledge and develop professional skills independently, using a variety of sources (native and foreign language) and modern technologies	The student is able to expand knowledge and skills in criminology using traditional forms and e-resources in Polish and English. Verifies the credibility of information obtained from various sources based on basic knowledge of physics. Understands the need for education in the direction of modern technological solutions, appreciates the participation of other fields of science in the development of criminology.	[SU1] oral statement/conversation/discussion
[KRYMMU2_UW05] Has the ability to independently propose solutions to a specific problem and carry out a procedure to reach a decision on it	The student is able to apply knowledge of physics to describe and analyze the results of physical and physicochemical tests. Has the ability to present them clearly. Verifies the credibility of information obtained from various sources based on known laws and principles of physics. Is able to critically select various pieces of information based on the laws of physics learned and recognizes the importance of the subject for criminology. Is able to propose an appropriate research method to verify a specific problem.	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report	
Subject contents	1. Examination of traces left by tools - optical and electron microscopy.2. Refractive index as an important parameter in forensic examinations.3. X-ray methods - analysis of hidden objects.		
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. Szummer - 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 redakcją M. 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	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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