

Subject card

Subject name and code	Biological methods of investigating traces of crimes - laboratory classes, PG_00132634						
Field of study	Criminology						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2027/2028		
Education level	Master's studies	Subject group			Optional subject group		
Mode of study	part-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			3.0		
Learning profile	academic	Assessment form			credit		
Conducting unit	Faculty of Law and Administration -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Monika Badura				
	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		0.0		60.0	75
Subject objectives	Practical application of botany, acarology and forensic entomology in the context of trace analysis and estimation of time and circumstances of death. Familiarisation with methods of identification/individuation of biological material. Hands-on learning of molecular biology tools for identification of plant species and molecular methods for establishing individual identity, paternity and relationship.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[KRYMMU2_U05] Is able to independently propose solutions to problems, carry out decision-making processes in this area, organise and coordinate team work, and act in an entrepreneurial manner.	The student can independently propose solutions to problems in the natural sciences, make decisions in this area, organise and coordinate teamwork, and act in an innovative manner.	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report [SU3] text preparation/written work [SU5] implementation of a problem task [SU6] demonstration of practical skills [SU8] observation of student's independent or team work
	[KRYMMU2_U02] Is able to independently acquire knowledge and develop professional competences using various sources (in native and foreign languages) and modern technologies.	They can learn independently and develop their professional skills by using a variety of sources in Polish and other languages, as well as modern technologies.	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report [SU3] text preparation/written work [SU6] demonstration of practical skills
	[KRYMMU2_U01] Is able to apply theoretical knowledge of criminology and related disciplines to analyse, synthesise and interpret complex and non-routine problems, as well as to formulate solutions in changing and unpredictable conditions.	They can use theoretical knowledge in the field of criminology and related disciplines to analyse, synthesise and interpret complex and unusual problems, and to formulate solutions to them in changing and unpredictable circumstances.	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report [SU3] text preparation/written work [SU5] implementation of a problem task [SU6] demonstration of practical skills
	[KRYMMU2_W02] Has an in-depth knowledge of the nature of natural sciences related to the studied major, their place in the system of sciences and their mutual relations	The student has an in-depth understanding of the nature of the natural sciences (biology) relevant to their field of study, their place within the scientific system, and the relationships between them.	[SW2] presentation/project/paper/report [SW3] text preparation/written work [SW5] implementation of a problem task
[KRYMMU2_K02] Responsibly prepares for work, is able to set priorities and plan activities, and takes responsibility for the performance of assigned tasks and team activities.	They prepare thoroughly for their work, are able to set priorities and plan their activities, and take responsibility for carrying out the tasks assigned to them and for the team's work.	[SK1] oral statement/conversation/discussion [SK6] demonstration of practical skills [SK8] observation of student's independent or team work	
Subject contents	Forensic acarology - application of mites in forensic science - cadaveric acarofauna and evidence in micro trace analysis. Methods of identification and preservation of mites. Forensic entomology - basic groups of insects relevant to attempts to reconstruct the date of death, entomological methods used in reconstructing the date of death of "fresh" cadavers - determination of larval development time under constant and varying temperature conditions, determination of age of larvae on the basis of their size, isomegalenic and isomorphic diagrams, values of thermal parameters governing insect development. Entomological methods used in the reconstruction of the date of death of bodies in an advanced stage of decomposition, as well as unburied, buried, hanged, burned, immersed corpses. Practical determination of the date of death on the basis of the above methods. Forensic botany - collection and preservation of material for botanical analysis from crime scenes and physical evidence. Use of palynology to determine the origin and movement routes of drugs and other illegally imported goods. Selected poisonous plants and their identification in various types of material. Collect plant samples for DNA analysis, isolate plant DNA, perform PCR reactions. DNA sequencing, carrying out PCR-STR. DNA sequencing and microsatellite DNA analysis. Forensic genetics - isolation of DNA from various types of biological material. DNA quantification by various methods including RT-PCR. Testing for Polymorphism of human DNA - RFLP and PCR techniques. Fluorescent detection of PCR products - capillary electrophoresis. DNA sequencing. DNA fragment length polymorphism (STR). DNA sequence polymorphism (SNP DNA). Y chromosome marker analysis - sexual harassment and rape cases. Investigation of disputed paternity and parentage of suspects. The problem of somatic mutations and transplants. Identification of a person's appearance through DNA testing. Interpretation of DNA profiles. Risks and sources of fundamental error in forensic genetic laboratory analysis (quality control).		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	forensic entomology - problem task	51.0%	20.0%
	forensic acarology - problem task	51.0%	20.0%
	human genetics - credit paper or report	51.0%	20.0%
	forensic botany - credit paper or report	51.0%	20.0%
molecular identification of organisms - credit paper or report	51.0%	20.0%	

Recommended reading	Basic literature	<p>Amendt J., et al. 2009. Current conceptions in Forensic Entomology. Springer.</p> <p>Boczek J., Błaszak C. 2005. Roztocze (Acari). Znaczenie w życiu i gospodarce człowieka. SGGW, Warszawa.</p> <p>Coyle H.M. 2005. Forensic botany. Principles and applications to criminal casework. CRC Press LLC, Boca Raton, London, New York, Washington D.C.</p> <p>Kaczorowska E., Draber-Mońko A. 2009. Wprowadzenie do entomologii sądowej. Wydawnictwo UG.</p> <p>Młodziejowski B., Sołtyszewski I. 2007. Ślady biologiczne. [W:] Goc M., Moszczyński I. (red.). Ślady kryminalistyczne. Ujawnianie, zabezpieczanie, wykorzystanie. Centrum Doradztwa i Informacji Difin, Warszawa, pp.: 125-186.</p> <p>Pawłowski R. 1997. Medyczo-sądowe badanie śladów biologicznych. Kraków Zakamycze.</p> <p>Szczerkowska Z. 1998. Badania biologiczne w ustalaniu ojcostwa. Instytut Ekspertyz Sądowych, Kraków.</p>
	Supplementary literature	<p>Butler J. 2001. Forensic DNA typing. Academic Press.</p> <p>Hołyst B. 2007. Kryminalistyka. Wydawnictwo Prawnicze LexisNexis, Warszawa.</p> <p>Izdebska J.N., Jankowski Z. 2006. Demodex brevis and D. folliculorum (Demodecidae): specific human parasites. A comparative study of the effectiveness of diagnostic methods involving autopsy. [W:] Postępy Akarologii Polskiej, Gabryś G., Ignatowicz S. (red.). SGGW, Warszawa: 128- 136.</p> <p>Krantz, G., Walter D. 2008. Manual of Acarology. Texas A & M University Press.</p> <p>Perotti A. M., Lee Goff M., Baker A.S., Turner B.D., Braig H.R. Forensic acarology: an introduction. Experimental and Applied Acarology 49: 3-13.</p> <p>Piotrowski F. 1996. Stawonogi - sprzymierzeńcy i wrogowie człowieka. PWN, Warszawa.</p> <p>Smith K.G.V. 1986. A manual of forensic entomology. British Museum of Natural History, Cornell University Press, London.</p> <p>Żółtowski Z. (red.) 1976. Arachnoentomologia lekarska. PZWL, Warszawa.</p>
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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