University of Gdańsk

Subject card

Subject name and code	Biological methods of investigating traces of crimes - lecture, PG_00132635		
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	exam
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	15.0	0.0	0.0	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

To learn the basics of botany, acarology and forensic entomology in relation to trace analysis and estimation of time and circumstances of death. To be familiar with methods of identification/individuation of biological material. To be familiar with molecular biological tools for the identification of plant species and molecular methods for the determination of personal identity, paternity and relationship.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[KRYMMU2_WG02] 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 knowledge of the nature of the natural sciences (biology) in relation to the subject studied, their place in the system of sciences and their interrelationships.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[KRYMMU2_WG05] Has an in-depth knowledge of methods and tools, including data and information extraction techniques, specific to criminology and forensic science	The student has an in-depth knowledge of methods and tools, including biological data and information extraction techniques, specific to criminology and forensic science	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[KRYMMU2_K05] Is able to independently and critically complement knowledge and skills, extended by the interdisciplinary dimension	The student is able to acquire knowledge and skills in an independent and critical way, extended by an interdisciplinary dimension (including natural sciences).	[SK1] oral statement/conversation/ discussion [SK4] test/exam - oral or written

Subject contents	Forensic acarology - Basics of acarology. Ecological forms of mites. Overview of the main groups of necrophagous mites, parasitic mites (especially living in human body tissues), allergenic, synanthropic and with high habitat specificity. Use of mites in forensic science - cadaver acarofauna and evidence in micro-trace analysis. Forensic entomology as a science. Urban entomology, stored products entomology and medical/forensic entomology (entomoscopy). Arthropods found on corpses. Factors influencing the fauna of corpses. Entomological methods used to reconstruct the time of death of 'fresh' cadavers and bodies in an advanced stage of decomposition. Insects found on Cannabis spp. and insects as causes of disease and death. Entomotoxicology. The use of DNA analysis in forensic entomology. Forensic botany - the place of botany in forensic science. Methods and aims of forensic botany. Theoretical and practical basis of pollen and macroscopic plant remains analysis. The use of botanical methods to determine the nature of the crime scene and the link between the suspect and the crime scene. The use of the ecological properties of plants to determine the time of the event. Secondary metabolites of plants as toxic substances. Plant and fungal species of pharmacopoeial importance: a review of selected species in the context of the action of the biologically active substances they contain (species characteristics, chemical properties, biological mechanisms of action, organismal responses). Review of plant species that are sources of drugs and stimulants. Symptoms of poisoning by plant and fungal toxins. Molecular biology in the identification of plant species. Forensic genetics - molecular methods used in attempts to establish personal identity, paternity and parentage. Molecular techniques used in phylogenetic and genealogical studies. Biochemical and molecular biological (mRNA) methods for identification of types of biological substances (blood, saliva, semen, hair, blood of pregnant women and newborns, menstrual blood, epithelia and epidermis, vomit, urine, faeces). Identification of species of traces by mitochondrial DNA polymorphism testing methods.
Prerequisites and co-requisites	
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
test - multiple choice, open questionquestions)	51.0%	100.0%

Recommended reading	Basic literature	Amendt J., et al. 2009. Current conceptions in Forensic Entomology. Springer. Błaszak C. (red.). 2011. Zoologia. T. 2, cz. 1 Stawonogi. Szczękoczułkopodobne, skorupiaki. PWN, Warszawa. Boczek J., Błaszak C. 2005. Roztocze (Acari). Znaczenie w życiu i gospodarce człowieka. SGGW, Warszawa. Byrd J.H., Castner J.L. 2009. Forensic entomology. The utility of arthropods in legal investigations. Second edition. CRC Press, Boca Raton, London, New York, Washington D.C. Connor J., Ferguson-Smith M. Podstawy genetyki medycznej. Warszawa, PZWL. Coyle H.M. 2005. Forensic botany. Principles and applications to criminal casework. CRC Press LLC, Boca Raton, London, New York, Washington D.C. Gawęda-Walerych K., Sołtyszewski I. 2005. Zastosowanie analizy mitochondrialnego DNA w badaniach kryminalistycznych - perspektywy. Instytut Ekspertyz Sądowych w Krakowie, Kraków. Izdebska J.N. 2005. Roztocze skórne człowieka i zwierząt domowych. [W:] Makowska-Wojciechowska B. (red.). Alergia na roztocze. Wyd. Mediton, Łódź, pp.: 95-105 Kaczorowska E., Draber-Mońko A. 2009. Wprowadzenie do entomologii sądowej. Wydawnictwo UG. 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. Pawłowski R. 1997. Medyczno-sądowe badanie śladów biologicznych. Kraków Zakamycze. Szczerkowska Z. 1998. Badania biologiczne w ustalaniu ojcostwa. Instytut Ekspertyz Sądowych, Kraków.

	Supplementary literature	Butler J. 2001. Forensic DNA typing. Academic Press. Hołyst B. 2007. Kryminalistyka. Wydawnictwo Prawnicze LexisNexis, Warszawa. 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. Krantz, G., Walter D. 2008. Manual of Acarology. Texas A & M University Press. 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. Piotrowski F. 1996. Stawonogi - sprzymierzeńcy i wrogowie człowieka. PWN, Warszawa. Smith K.G.V. 1986. A manual of forensic entomology. British Museum of Natural History, Cornell University Press, London. Żółtowski Z. (red.) 1976. Arachnoentomologia lekarska. PZWL, Warszawa.
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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