

<b>Study Programme: Master Academic Studies in Forensics</b>			
<b>Course Unit Title: Forensic Entomology</b>			
<b>Course Unit Code: FB-10</b>			
<b>Name of Lecturer(s):</b> Dušan Petrić, full professor; Aleksandra Ignjatović Čupina, associate professor; Aleksandar Jurišić, associate professor; Aleksandra Petrović, assistant professor			
<b>Type and Level of Studies:</b> Master academic studies, second level			
<b>Course Status (compulsory/elective):</b> Elective			
<b>Semester (winter/summer):</b> Second (summer) semester			
<b>Language of instruction:</b> Serbian, optionally English			
<b>Mode of course unit delivery (face-to-face/distance learning):</b> Face-to-face			
<b>Number of ECTS Allocated:</b> 6			
<b>Prerequisites:</b> None			
<b>Course Aims:</b> Providing knowledge on application of entomology in forensic research and its importance, morphology, biology, ecology and behavior of insects, ticks and mites of forensic significance, strategies of colonization and infestation; detection of event scenarios in medico-criminal acts, public health and hygiene issues, damages incurred in urban habitats, warehouses and traffic of goods.			
<b>Learning Outcomes:</b> Acquiring knowledge and skills for: independent and team work in solving problems related to forensic entomology (medico-criminal entomology, urban forensic entomology and stored product entomology); applying specific entomological knowledge in detection of causes and scenarios of conducted criminal acts, economically and other legally harmful events; implementation of concepts and ideas of forensic entomology in solving criminal acts and legal disputes; laying out conclusions and opinions based on the principles of forensic science, up on request of legal authorities and other subjects ordering the expert's opinion.			
<b>Syllabus:</b> <p><b>Theory:</b> Introduction to Forensic Entomology. Arthropods (Insecta and Acarina) and their activity as evidence in the judicial system. Systematics, morphology, biology and behavior of arthropods of forensic significance. Diet regimes, reproduction strategies, olfactory attraction and communication (pheromones, kairomones and allomones). Temperature and photoperiod influences, preferences and tolerance. Application of forensic entomology in investigation of human and animal death cases, relationship between insects and mortal remains: necrophagous species, parasites, parasitoids and predators of necrophagous species, omnivorous species, specialists and generalists. Insects and phases of corpse decomposition. Insects as indicators of: causes of traumas and deaths, timing and locating the <i>situs</i> of a criminal event, movement of corpse after death. Determination of <i>post-mortem</i> interval, colonization and successions of communities of necrophagous species (in natural and artificial conditions), factors delaying invasion of corpses. Insects in proving neglect and abuse. Hematophagous arthropods and blood meal as evidence material. Entomotoxicology, detection of drugs and toxins in insects and their effects to the insect development. Insects and mites of forensic significance in urban environments and warehouses, their role in detecting criminal acts and resolving legal disputes. Insects of forensic importance in residential buildings and open urban areas (parks, avenues, courtyards, gardens, waste disposal sites and other urban areas). Primary and secondary pests of stored products and products at the market (food pests and food contamination caused by insects and mites, pests of textiles, wood and timber), thresholds of harmfulness, determination of population size and damages. Determination of responsibility in the chain of implementation of prevention and control measures against harmful insects and mites. Methods of collection, conservation and rearing of insects and mites in forensic investigations.</p> <p><b>Practice:</b> Laboratory exercises are based on individual work of students on recognition of different taxonomic categories of arthropods of forensic importance (orders, families, species) and their stages of development, conducted by the use of keys for morphological identification (entomological material available).</p>			
<b>Required Reading:</b> <p><b>Rivers D.B., Dahlem G.A.</b> (2014): The Science of Forensic Entomology. Wiley Blackwell, UK, 382 pp.; <b>Gennard D.E.</b> (2007): Forensic entomology: an introduction. Willey &amp; sons, UK. 224 pp +IX; <b>Smith K. G.V.</b> (1986): A manual of forensic entomology. The British Museum (Natural History) and Cornell University Press, UK. 205 pp.; <b>Gullan P.J., Cranston P.S.</b> (2010): The insects, an outline of entomology. Fourth edition. Wiley-Blackwell, UK. 565 pp.; <b>Gibb T.J., Oseto C.Y.</b> (2006): Arthropod Collection and Identification Field and Laboratory Techniques. Elsevier Academic Press, UK. 311 pp.; <b>Schauff M.E.</b> (2001): Collecting and preserving insects and mites: techniques and tools. Systematic entomology laboratory, USDA, National Museum of Natural History. 68 pp.; <b>Greenfield M.D.</b> (2002): Signalers and Receivers, Mechanisms and Evolution of Arthropod Communication. Oxford University Press, 414 pp.; <b>Lehane M.J.</b> (2005): The Biology of Blood-Sucking in Insects. Second edition. Cambridge University Press, UK. 321 pp.; <b>Harwood, R.F. and James, M.T.</b> (1979): Entomology in human and animal health, Macmillan PublishingCo., Inc. New York, 547pp.; <b>Robinson W.H.</b> (2005): Urban Insects and Arachnids, A handbook of Urban Entomology. Cambridge University Press, UK. 472 pp. <b>Collective of authors</b> (1972): Štetočine u skladištima, biologija i suzbijanje sa osnovama uskladištenja poljoprivrednih proizvoda. Faculty of Agriculture, Novi Sad, 540 pp+I-VII; (in Serbian); <b>Petrić D., Ignjatović Čupina A., Vuković M., Srdić Ž.</b> (2007): Opšta entomologija, udžbenik ( General entomology, textbook), Faculty of Agriculture, Novi Sad, CD edition, 200 pp. (in Serbian); <b>Petrić D., Ignjatović Čupina A., Vuković M., Srdić Ž.</b> (2007): Opšta entomologija, praktikum (General Entomology, practicum), Faculty of Agriculture, Novi Sad, CD edition, 50 pp. (in Serbian); <b>Ignjatović Čupina A., Petrić D.</b> (2012): Ključ za familije nadklase Hexapoda (Key for identification of families of the superclass Hexapoda), Faculty of Agriculture, Novi Sad, CD edition, 72 pp. (in Serbian);</p>			
<b>Weekly Contact Hours: 5</b>		<b>Lectures: 3</b>	
		<b>Practical work: 2</b>	
<b>Teaching Methods:</b> Theoretical lessons in form of presentations by the use of modern teaching tools (computer and other didactic tools), recapitulation of knowledge, group and individual consultations, seminars. Check of theoretical knowledge: tests which require the combination of acquired knowledge. Practical lessons: based on individual work with fresh and preserved entomological material, use of binocular microscope, dissection tools. Check of practical knowledge is foreseen.			
<b>Knowledge Assessment (maximum of 100 points):</b>			
<b>Pre-exam obligations</b>	points	<b>Final exam</b>	points
Active class participation	10	written exam	
Practical work	10	oral exam	50
Preliminary exam(s)	20		
Seminar(s)	10		