



Study program: Integrated Academic Studies in Pharmacy			
Course title: Laboratory Animals and Experimental Methods			
Teacher: Isidora N. Samojlik, Saša N. Vukmirović, Nebojša P. Stilinović, Boris T. Milijašević			
Course status: elective (necessary before the experimental/graduation paper on laboratory animals)			
ECTS Credits: 3			
Condition: -			
Course aim To familiarize students with the means, opportunities and working conditions when working with experimental animals in biomedical research.			
Expected outcome of the course The students will get acquainted with conditions and possibilities of working with experimental animals and particular experimental models of importance for <i>in vivo</i> biomedical research. The students will get informed on legal regulations pertaining to protection of welfare of experimental animals, animal models and species used in particular investigations, the housing and care of experimental animals, application of investigated substances, monitoring the effects of applied substances, euthanasia and safe disposal of residual/waist material. The students will be trained for experimental work with laboratory animals (handling, administration of substances, sampling of biomaterial, anesthesia, monitoring of stress and pain parameters...) as well as for creating relevant documentation aimed to obtain necessary approvals for experimental work with laboratory animals.			
Course description <i>Theoretical education</i> Legislation and welfare of experimental animals in biomedical research. The principles of ethics of working with experimental animals. The rule of "3-R's" and "five freedoms" in working with experimental animals. Categories of invasiveness in animal experiments. Alternative methods for in vivo experiments. Laboratory (experimental) animals - classification and nomenclature, types. Maintenance of experimental animals - accommodation, food and drinking water, hygiene, monitoring health status (stress and pain). Animal models - the model definition, requirements, selection. Basic rules of handling experimental animals - keeping, labeling, application of experimental substances, sampling material for analysis. Experimental models in non-anesthetized animals. Experimental models in anesthetized animals. Euthanasia and risks when working with experimental animals. <i>Practical education</i> Requests to the Ethics Committees for permission to work with experimental animals, in accordance with law. Practical introduction to the way of maintenance of experimental animals. Practical mastering the skills of handling experimental animals - keeping, labeling, application of experimental substances, sampling material for analysis. Development of an experimental model in accordance with the request to the Ethics Committee (research plan that includes work on experimental animals). Practical mastering of handling animal products (samples, bodies of euthanized animals) , substances and equipment used in the planned experiment.			
Literature <i>Compulsory</i> 1. Chow P, Ng R, Ogden B. Using animal models in biomedical research. World Scientific Publishing Co. Pte. Ltd., Singapore 2007. 2. Hau J, Van Hoosier GL. Handbook Of Laboratory Animal Science, Vol I &II, CRC Press, Boca Raton, Florida 33431, 2003. <i>Additional</i> 1. Kaliste E. The Welfare of Laboratory Animals. Springer, Dordrecht, The Netherlands, 2007. 2. Wahlsten D. Mouse Behavioral Testing. Academic Press, Elsevier, London NW1 7BY, UK, 2011.			
Number of active classes		Theoretical classes: 30	Practical classes: 15
Teaching methods Theoretical and practical			
Student activity assessment (maximally 100 points)			
Pre-exam activities	points	Final exam	points
Lectures	50	Written	50
Practices		Oral	-
Colloquium	-	
Essay	5*		
*.- if a student does an essay, he/she can get 5 points if he/she misses, up to a maximum of 100			

