

|   |   |
|---|---|
| Course description  |   |
| <b>Course</b>   | Laboratory Animal Science and Animal Welfare                        |
| <b>Department</b>   | Animal Breeding, Nutrition and Laboratory Animal Science Department |
| <b>Language</b>   | English   |
| <b>Nature</b>   | Mandatory   |
| <b>Year/semester</b>  | 1st year, spring-term or 2nd year fall-term (or: every January)     |
| <b>Credits (ECTS)</b>   | 8   |
| <b>Lectures (hour/semester)</b>   | 80  |
| <b>Plenary lectures (hour/semester)</b>   |   |
| <b>Practicals (hour/semester)</b>   | 0   |
| <b>Responsible teacher</b>  | Dr.Sándor György FEKETE   |
| <b>Teacher(s)</b>   | Dr. Sándor György FEKETE, Dr. András BERSÉNYI, Dr. Gabriella KORSÓS |
| <b>Prerequisites</b>  | Diploma (DVM, MD), MSc in Biol. or Zool. or Agric. Sci.)            |
| <b>Learning outcome</b> (include skills and competencies, if any)   |   |
| Knowledge about the experimental design, the 3Rs principles, standardisation (genetic, microbiological, sex, nutrition, level of stress, pain and suffering), simple experimental techniques (handling, sampling), ethics and practice of anaesthesia and euthanasia. |   |
| <b>Outcome assessment</b>   |   |
| Writing a bioethical essay, and experimental design and a critical analysis of a professional paper. Writing of test and miniassays about the factual parts of the discipline.  |   |
| Weekly schedule of lectures and practicals  |   |
| <b>WEEK</b>   | <b>Lecture topics</b>   |

|        |   |
|--------|---|
| Week 1 | Introduction to the laboratory Animal Science. Experimental Designs. How to write and analyse a scientific paper and a research proposal. The animal model, importance of sexual dimorphism and the possibility of extrapolation. Anatomia of mice, rat and birds. Biology and physiology of the laboratory Glires, Birds, Pigs and Ruminans. Characteristics of Non-Conventional Experimental Animals. Reproduction biology of mouse, rat, rabbit and ferret. The Physiology of the Pain. The Pharmacology of Analgesia-Anaesthesia and Euthanasia. Stress, distress, eustress and the laboratory animals. Basics of the Nutrition of the Laboratory Animals. Importance of mycotoxins. Epi-, nutri- and toxicogenomics and the laboratory animal science. The Microbiological Standardisaion. The Fish as an experimental animal. Desing and running a laboratory Animal Facility. The pain and the animal welfare. Evaluation of pain and its categories. Grimace Score Systems. Alleviation and prevention of pain and suffereing. Genetics of laboratory animals. Stem cell rechearch and techniques. The CRIPS/Cas technique and the perpectives of its application.The laparo- and thorascopy and the microsurgery as a tool of animal protection and 3rd R. Bird teratology. Teratology of mammals.Basics of the GLP. The toxicological activity of OECD. |
| Week 2 | General pathology. The role of pathology and histopathology in the animal experimentation. Non-infectious ailments of laboratory animals. Infectious diseases of mice and rats. Zoonoses. Biological rhythms and their significance in the experimental design. Experimental work with birds. Animal Experimentations using SPF-birds, using BSL3 and BSL4. Alternativ techniques: theory and practice. Possibility of replacement, reduction and refinement in the pharmacological, toxicological and safety studies. Animal models in experimental psychiatry: possibilities and pitfalls of translation. The social media and the public oppinion of animal suffering and in vivo studies. The Hungarian law of Animal Protection and its implementing regulations. Chaos and complexity theory and its influence on the planning and evaluation of animal experimentation.  |

| WEEK   | Practical topics   |
|--------|--|
| Week 1 | Section of mice and rats. Hanging. Sex determination. Anaesthesia and anlgesia. Sampling of urine, faeces, blood and others. Grimace Scale - Pain Evaluation. Simple experimental techniques (mouse, rat, golden hamster, guinea-pig, rabbit, poultry). Consultation for the final exam. |
| Week 2 | Histology and pathohistology. Discussion about the justification of living animal experimentation versus in vitro. The 3Rs in analgesia, anaesthesia and humane euthanasia. Cost-benefit analysis, non-professional summary.   |

| Recommended literature   |
|--|
| <p>Liu, E.-Fan, J.: Fundamentals of Laboratory Animal Science. 1st ed. , 2017.</p> <p>Van Zutphen, LFM.-Bauman, V.-Beynen, AC: Priciples of Laboratory Animal Science. Elsevir. Amsterdam, 1993, 2000.; NRC: Nutrient requirements of laboratory rodents. Washington, 1986; Svedsen, P.-Hau, J. (eds): Handbook of Laboratory Animal Science. CRS Press. Boca Raton, Fla, 1994, 2004; Hau, J.-VanHoosier, G.L.Jr. (ed): Handbook of Laboratory Animal Science. 2nd ed. CRCPress LLC. Boca Raton-London-New York-Washington DC, 2003-2005.; Regan, T.: The case of animal rights. Univ. Calif. Press. Berkeley, Los Angeles, 1983; Bryan Howard, B.-Nevalainen, T.- Perretta, G.:The COST Manual of Laboratory Animal Care and Use: Refinement, Reduction, and Research. CRC Press, 2010. Fekete, SGy: Feeding and Nutrition of the Laboratory Rabbit. In: DeBlas, C-Wiseman, J.: The Nutrition of the Rabbit. CABI Publ. Oxon-New York, 2019</p> |

| Note(s) |
|---------|
|         |

