Course syllabus for

Laboratory animal science, behavior and metabolism, 7.5 credits

Försöksdjursvetenskap, beteende och metabolism, 7.5 hp
This course syllabus is valid from autumn 2023.

Course code	4FF009
Course name	Laboratory animal science, behavior and metabolism
Credits	7.5 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Translational Physiology and Pharmacology
Level	AV - Second cycle
Grading scale	Fail (U), pass (G) or pass with distinction (VG)
Department	Department of Physiology and Pharmacology
Decided by	Education committee FyFa
Decision date	2022-11-23
Course syllabus valid from	Autumn 2023

Specific entry requirements

At least the grade Pass on the courses Integrated physiology and pharmacology (semester 1) and Physiological and pharmacological mechanisms and experimental methods (semester 2) on the Master (120 credits) programme in Translational Physiology and Pharmacology.

Objectives

Upon completion of the course, the student should be able to meet the defined intended learning outcomes according to the EU Education and Training framework for people who undertake experimental minor procedures (EU modules 1-7) involving rodents and lagomorphs. The student will also acquire fundamental practical skills of minimally invasive procedures on mice (EU module 3.2, 6.2 and 8) and rats (EU module 3.2) and initial knowledge on the design of animal experiments and good scientific practice in research with animals (EU module 9-11).

At the end of the course, the student should be able to:
Regarding knowledge and understanding

- describe key principles in EU and Swedish legislation regarding the use of animals in science,
- identify ethical and welfare issues in relation to the use of animals in scientific procedures, including basic principles of the 3Rs ("replacement, reduction and refinement"),

- explain basic principles regarding species-specific biology and husbandry including anatomy, physiology, reproduction, nutrition, behaviour, enrichment and genetics for rodents and lagomorphs,
- describe various aspects regarding species-specific animal health, care and management, including control of environment, husbandry practices, diet, health status and disease for rodents and lagomorphs,
- identify species-specific behaviour signs of discomfort, pain, suffering and distress for rodents and lagomorphs,
- describe appropriate principles for and different methods of euthanasia for rodents and lagomorphs,
- describe the principles behind different tests used to assess animal metabolism,
- evaluate different experimental methods to assess rodent behaviours in research.

Regarding skills and abilities

- handle and restrain mice and rats according to good practice,
- perform or simulate minor techniques, such as injections (dosage, blood sampling) on mice and rats,
- describe the skills required for humane killing of mice and rats,
- analyse data from metabolic tests,
- analyse behaviour data from rodents.

With respect to judgement and approach

- demonstrate an ethical, respectful and considerate attitude to research animals and their tissues,
- discuss principles and concepts of experimental design of studies using rodents and lagomorphs,
- recognize good scientific practice in animal research.

Content

The course provides education and training in laboratory animal science for those who will need to undertake experimental procedures, with focus on rodents and lagomorphs and provides initial training to those who will be involved in the design of experimental procedures and analyse scientific literature and/or data that have been generated from studies that involve animals.

The course contains web-based lectures on the requirements according to Swedish legislation about scientific use of animals, ethical problems, basic species-specific biology, normal behaviours of rodents and lagomorphs, handling, husbandry needs and enrichment, signs of discomfort, pain and suffering in rodents and lagomorphs, different methodologies, the basis of disease control and how to implement hygiene in animal housing and experimental work.

The students will accomplish the practical part of the course within an animal laboratory setting where learning activities will take place. The activities include handling, restraining, dosing, blood sampling and euthanasia in both simulators and in mice and rats.

Additionally, students will design a research protocol (project work) for an animal experiment with the structure of an ethical application.

More specifically, the course will cover:

- Legislation affecting animal research.
- Ethics, animal welfare and the 3Rs.
- Basic and appropriate biology of common rodents and lagomorphs used in research.
- Animal care, health and management of rodents and lagomorphs.
- Recogintion of pain, suffering and distress of rodents and lagomorphs.

- Euthanasia of rodents and lagomorphs.
- Minimally invasive procedures without anaesthesia in rodents and lagomorphs.
- Design of scientific procedures and projects involving rodents and lagomorphs.
- Collection and analysis of indirect calorimetry data.
- Overview of tests designed to assess different behavioural parameters.

Teaching methods

The course has a blended learning approach using synchronous and asynchronous education and training including web-based learning which is combined and supported with seminars, interactive sessions, discussions, supervision and practical handling of mice and rats. In addition, group work focuses on a specific scientific project involving rodents and lagomorphs and is presented orally and discussed.

Examination

Laboratory Animal Science:

Successful completion of the self-assessment in the web-based learning.
Performance and attitude in practical sessions. Graded Fail/Pass.
Oral presentation. Graded Fail/Pass.
Written examination. Graded Fail/Pass/Pass with distinction.

Behaviour and metabolism:

Written assignment. Graded Fail/Pass/Pass with distinction.
Oral presentation. Graded Fail/Pass.

Written assignments should be submitted before the end of the course according to the specification in the schedule. To pass the course (the grade Pass or higher), at least Pass on all examinations in the course is required. To pass the course with distinction, the grade Pass with distinction on the written examination and the written assignment is required.

Compulsory participation
Seminars, interactive sessions, discussions, supervision, practical sessions and oral presentations are compulsory.
A Pass grade requires attendance at compulsory lectures. The examiner decides if, and how, absence from compulsory parts can be compensated. Study results cannot be reported until the student has participated in compulsory course elements or compensated for any absence in accordance with instructions from the examiner. Absence from a compulsory educational component may mean that the student cannot take the opportunity until the next time the course is given.

Limitation of number of tests

The students that have not passed after regular examination session have the right to participate at further five examination sessions. If the student has carried out six failed examinations/tests, no additional examination or new course admission is approved.

Each occasion the student participates in the same test counts as an examination. Submission of a blank exam paper is regarded as an examination. In case a student is registered for an examination but does not attend, this is not regarded as an examination.

In the event of special circumstances, or if a student with a disability is in need of certain adjustments, the examiner may decide to depart from the syllabus' regulations on examination form, number of examination opportunities, possibility of completion or exemption from compulsory educational elements, etc. Content and intended learning outcomes as well as the level of expected skills, knowledge and abilities must not be altered, removed or lowered.

Other information

Only education and training give not skills to work with laboratory animals. To be able to work with laboratory animals is both education, training and skills a precondition. This course gives education and training in laboratory animal science, which this course is a precondition to start to work under supervision. Certification to work independently with animals can however only be received after additional exercise and/or supervision and assessment of qualified laboratory animal staff. Such certification is not included in this course.

Transitional provisions

After each course there will be at least 6 opportunities to sit the examination within a two-years period.

Other directives

The course is offered in English. Course evaluation takes place according to the guidelines that are established by the Committee for education at basic level and second cycle.

Literature and other teaching aids

Mandatory literature

Material available on the course website. Supplementary study materials and reference articles will be provided during the course.

Recommended literature

Handbook of laboratory animal science. : Essential principles and practices
Hau, Jann; Schapiro, Steven Jay

3. ed. : Boca Raton : CRC Press, cop. 2011 - 723 s.
ISBN:978-1-4200-8455-9 (vol.1) LIBRIS-ID:12096142
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