



**Karolinska  
Institutet**

Course syllabus for

# **Laboratory Animal Science in Theory and Practice, 4.5 credits**

Teoretisk och praktisk försöksdjursvetenskap, 4.5 hp

This course has been cancelled, for further information see Transitional provisions in the last version of the syllabus.

Please note that the course syllabus is available in the following versions:

[Spring2017](#) , [Spring2019](#) , [Spring2020](#) , [Spring2021](#)

Course code	4BI103
Course name	Laboratory Animal Science in Theory and Practice
Credits	4.5 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Biomedicine
Level	AV - Second cycle
Grading scale	Pass with distinction, Pass, Fail
Department	Comparative Medicine
Decided by	Programnämnd 7
Decision date	2016-11-03
Revised by	Programme committee for study programmes in biomedicine
Last revision	2019-10-25
Course syllabus valid from	Spring 2020

## **Specific entry requirements**

A Bachelor's degree or a professional degree worth at least 180 credits in biomedicine, biotechnology, cellular and molecular biology or medicine. English language skills equivalent to English B at Swedish upper secondary school.

## **Objectives**

Upon completion of the course, the student should be able to meet the defined learning outcomes as set out in the EU Education and Training Framework for people who undertake experimental minor procedures (EU modules 1-8) involving rodents and lagomorphs. The student will also achieve initial knowledge on the design of animal experiments and good scientific practice in animal research (EU modules 9-11). At the end of the course, the student should be able to:

Regarding knowledge and understanding

- describe key principles of 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 of 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 the environment, husbandry practices, diet, health status and disease for rodents and lagomorphs
- identify behavioural species-specific signs of discomfort, pain, suffering, and distress for rodents and lagomorphs
- describe appropriate principles for and different methods of euthanasia for rodents and lagomorphs,

#### Regarding competence and skills

- handle and restrain mice and rats according to good practice,
- perform or simulate minor techniques, such as injections (dosing/ blood sampling), on mice and rats,
- demonstrate the skills required to euthanise mice and rats,

#### Regarding judgement and approach

- Discuss principles and concepts of experimental design of studies in rodents or lagomorphs, and good scientific practice,
- Demonstrate a respectful and considerate attitude to research animals and their tissues.

## Content

This course provides education and training in laboratory animal science for those who will undertake experimental procedures, with focus on rodents and lagomorphs, and provides initial training for those who will design experimental procedures and analyse scientific literature and/or data that have been generated from studies involving animals.

The course contains web-based lectures on the requirements of Swedish legislation concerning scientific use of animals, ethical issues, species-specific basic biology, normal behaviour 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 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.
- Recognition 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.

## Teaching methods

The course has a blended learning approach using web-based learning, which is combined and supported with seminars, interactive sessions, discussions, tutorials, 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.

The course director assesses if and, in that case, how absence can be compensated. Before the student has participated in all compulsory parts or compensated absence in accordance with the course director's instructions, the student's results will not be registered in LADOK.

Absence from a compulsory activity may result in that the student cannot compensate the absence until the next time the course is given.

## Examination

The examination consists of the student's performance and attitude in practical sessions, oral presentation and a final written exam. The grade Pass with distinction is based on the final written exam and successful completion of the self-assessment in the web-based learning.

Compulsory elements:

Seminars, interactive sessions, discussions, practical sessions and oral presentations are compulsory.

Limitation of number of examinations or practical training sessions

Students who have not passed the regular examination are entitled to participate in five more examinations. If the student has failed six examinations/tests, no additional examination or new admission is provided.

The number of times that the student has participated in one and the same examination is regarded as an examination session. Submission of a blank examination is regarded as an examination. An examination, for which the student registered but not participated in, will not be counted as an examination.

## Transitional provisions

After each course occasion there will be at least six occasions for the examination within a two-year period from the end of the course.

## Other directives

The course language is English.

Course evaluation will be carried out in accordance with the guidelines established by the Board of Higher Education.

Education and training alone does not deliver competence to work with research animals. To be able to work with research animals, both education and training, and competence are a pre-requisite. This course provides education and training in laboratory animal science, which is a pre-requisite to start working under supervision. However, certification for working independently with animals can only be obtained after additional supervision from and assessment by qualified animal facility personnel. This certification is not included in this course.

## Literature and other teaching aids

Mandatory reading material:

E-learning material that is available online via Ping Pong.

**Handbook of laboratory animal science. : Essential principles and practices**

*Hau, Jann; Schapiro, Steven Jay*

3. ed. : Boca Raton : CRC Press, cop. 2011 - 723 s.

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