

Laboratory Animal Science for Researchers (1002863)

Course size *(nominal values; actual values may depend on programme)*

Credits 7.5 **Study time 200 h**

Course offerings in academic year 2024-2025

A (semester 1) English Gent

Lecturers in academic year 2024-2025

Båtnes, Anna Solvang TRONDH01 lecturer-in-charge

Offered in the following programmes in 2024-2025

	crdts	offering
International Master of Science in Health Management in Aquaculture	7.5	A

Teaching languages

English

Keywords

Relevant legislation, ethics, biology of laboratory animals, management of laboratory animals, health hazards, assessment of pain and humane endpoints, Design and statistics, public concerns

Position of the course

Laboratory animal science (LAS) is a multidisciplinary branch of science. The main aim of this course is to ensure ethical and humane handling of experimental animals and the collection of informative, objective and reproducible research data from animal experiments.

The course is divided into one general section and two special sections. All students must complete the general section. In the special sections, the students can choose between traditional laboratory animals (rodents, pigs) or fish/aquatic organisms. Course participants should select their specialization on the basis of the animals they will work with after the course.

Contents

*This course is for people who are going to work with **live aquatic animals** for scientific purposes. People who are going to work with live rodents, pigs or model fish for scientific purposes are directed to the national course in laboratory animal science, CareIn. [Link to CareIn](#)*

Laboratory animal science (LAS) is a multidisciplinary branch of science. People who will work with research animals, or plan and design experiments involving live animals, need adequate education and training in LAS before they can start their work. This course aims to give the necessary theoretical qualifications to work with live aquatic animals for scientific purposes.

The main aim of this course is to ensure ethical and humane handling of aquatic animals and the collection of informative, objective and reproducible research data. The course follows the theoretical requirements described in the Norwegian regulation on animal experimentation (FOR-2015-06-18-761) §25 and annex E. Additionally, the course aims to follow the theoretical requirements described in the Education and Training Framework by the European Commission to fulfill the requirements for functions (a) (persons who carry out procedures on animals), (b) (persons who design procedures and projects) and (d) (persons who kill animals). The focus of the species-specific parts of the training will be towards aquatic animals.

After completion of this course the participants need practical training with animals. This is organized at the research animal facility at the candidates' home

institution.

The course is organized as one part containing general modules for laboratory animal science, and one part focusing on fish and aquatic animals.

Topics included in the general part:

- Legislation
- Ethics, animal welfare and 3R (levels 1 and 2)
- Health hazards
- Humane endpoints
- Severity classification
- Humane killing of animals
- Public administration and the course of events in animal experiments
- Design and statistics

Topics included in the part for fish and aquatic animals:

- Legislation concerning fish research
- Experimental conditions
- Stress, biorythms and acclimatization
- Pain and suffering
- Anesthesia
- Handling
- Surgical procedures
- Euthanasia
- Aggression and hierarchy formation
- Health monitoring and microbiological qualities
- Genetically modified fish

Initial competences

Basic knowledge in anatomy and physiology, competence in statistics, knowledge about literature searches on the internet and in libraries

Final competences

- 1 The student should be able to:
Identify and describe the national and European legislation which regulate the scientific use of animals
- 2 Describe the authorisation that is needed before acting as a user, breeder or supplier of laboratory animals and especially the authorisation required for projects
- 3 Indicate who bears primary responsibility for the animals undergoing procedures
- 4 Describe the differing views within society concerning the scientific use of animals
- 5 Identify ethical and animal welfare issues in their own work
- 6 Demonstrate a comprehensive understanding of the principle of the 3Rs, list examples of how the 3Rs can be implemented in research projects and list sources of information related to the 3Rs
- 7 Describe the severity classification system and give examples of each category
- 8 Describe the basic biology of the relevant animal species, including basic anatomy, physiology, reproduction and behaviour; and recognise the importance of attending to biological and behavioural needs
- 9 Describe the importance of providing an enriched environment to laboratory animals and give examples of environmental enrichment that is appropriate to the species
- 10 Describe the environmental factors of importance for maintaining an appropriate health status for the animals
- 11 Describe the biological consequences of acclimatization, habituation and training
- 12 List potential human health hazards associated with contact with laboratory animals and describe how these can be prevented or reduced
- 13 Describe abnormal behaviour and signs of discomfort, pain, suffering or distress
- 14 Discuss methods available for assessing animal welfare
- 15 Describe the principle of implementing early humane endpoints and how this implementation can influence animal health and welfare during the course of an experiment

- 16 Define the term "humane killing" and list appropriate euthanasia methods for the relevant animal species
- 17 Recognise that the choice of a euthanasia method may influence the scientific outcome
- 18 Describe appropriate methods and principles for handling animals, and describe common techniques / procedures, including administration and sampling techniques
- 19 Describe where to find relevant and up-to-date information about refinement of animal experiments

- 20 List the different types of formal experimental designs
- 21 Identify the experimental unit
- 22 Describe the variables affecting significance, including the meaning of statistical power and the "p-value"
- 23 Describe how to monitor the microbiological health of laboratory animals
- 24 Indicate some of the problems associated with pain recognition and pain management in animals

Conditions for credit contract

This course unit cannot be taken via a credit contract

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Seminar, Lecture

Extra information on the teaching methods

The theoretical teaching will happen partly as digital self-studies using e-based learning tools with tests and assignments, and partly as lectures (given online or in an auditorium).

The general part will consist of e-based learning tools using course material that will be made available in Blackboard. There will be tests and other assignments to most of the course modules. Completion of tests and assignments is mandatory. The deadline will be given around the start of the semester. Supplementary lectures will be given as online lectures.

The special part for fish and aquatic animals will consist of lectures, either online or in an auditorium.

People who will work with live animals need practical training. The practical training is not part of this course. The practical training needs to be supervised by persons with relevant and up-to-date competence regarding the species and the techniques. Supervision shall take place until the candidate can demonstrate acceptable performance without unnecessary stress to the animals.

People who complete the theoretical course and the practical training will get a course certificate that confirms training to fulfil functions (a) (performing procedures on animals), (b) (designing procedures and projects) and (d) (killing animals). Persons who complete only the theoretical course will get a course certificate that confirms training to fulfil function (b).

Study material

None

References

The course syllabus will be the learning material to be used during the course, and in addition a selection of articles and other written material that will be made available for the students. As supportive literature, a text book in laboratory animal science for fish research/aquatic animals is recommended.

Course content-related study coaching

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Written assessment, Assignment

Examination methods in case of periodic assessment during the second examination period

Written assessment, Assignment

Examination methods in case of permanent assessment

Participation

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

Mandatory assignments

If the written exam is evaluated as "failed" the written exam must be repeated. If the home exam is evaluated as "failed" a new home exam must be submitted.

Calculation of the examination mark

The exam is a written home exam or a normal written exam, counting 70/100.

Assignment include obligatory lectures and counts 30/100.

Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.