Course Specifications

From the academic year 2021-2022 up to and including the academic year

Laboratory Animal Science for Researchers (I002863)

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

Credits 7.5		**Study time** 200 h		**Contact hrs**	60.0h

Course offerings in academic year 2022-2023

A (semester 1)   English   Gent

Lecturers in academic year 2022-2023

Eggen, Siv	TRONDH01	lecturer-in-charge
Åm, Marte Kierulf	TRONDH01	co-lecturer
Kjørsvik, Elin	TRONDH01	co-lecturer

Offered in the following programmes in 2022-2023	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 multidiciplinary 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

General part:
Topics in this section will include national and international legislation, design and statistics, public administration and the course of events, ethics, 3Rs and attitudes in society, humane endpoints, severity classification, humane killing, health hazards.

Part for Fish and aquatic animals specialization:
Topics in this section will include legislation concerning fish, experimental conditions, stress, biorythms and acclimatization, pain and suffering, anesthesia, handling, surgical procedures and euthanasia, aggression and hierarchy formation, health monitoring and microbiological qualities, genetically modified fish.
The part covering traditional laboratory animals is not relevant for AquaH.
The course will cover the following topics:
• *Legislation;*
• *Ethics, animal welfare, and 3R;*
• *Different views in the society;*
• *Species specific biology of laboratory animals;*
• *Management of laboratory animals;*
• *Microbiological qualities;*

- *Genetically modified animal models;*
- *Environmental factors that may influence animal experiments;*
- *Health hazards;*
- *Assessment of pain and humane endpoints;*
- *Severity classification;*
- *Humane killing of animals,*
- *Public administration and the course of events in animal experiments;*
- *Design and statistics;*
- *Principles of minimally invasive procedures on animals;*
- *Anesthesia and analgesia for minor and long-lasting procedures;*
- *Basic surgery*

Initial competences

Competence for admission to EM AquaH study program and first semester courses at UGent. Batchelor of marine science and aquaculture for national program MSOCEAN. Faculty of Medicine and Health Science require basic knowledge in anatomy and physiology, competence in statistics, knowledge about literature searches on the internet and in libraries, fulfilled by AquaH students.

Final competences

1 The student should specifically 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, and how a laboratory animal facility is organized to maintain an appropriate health status and welfare of animals

11 Describe the biological consequences of acclimatization, habituation and training

12 Describe how genetically altered animals can be used for scientific research and the importance of monitoring such animals very carefully

13 List potential human health hazards associated with contact with laboratory animals and describe how these can be prevented or reduced

14 Describe abnormal behaviour and signs of discomfort, pain, suffering or distress

15 Discuss methods available for assessing animal welfare

16 Describe the principle of implementing early humane endpoints and how this implementation can influence animal health and welfare during the course of an experiment

17 Define the term "humane killing" and list appropriate euthanasia methods for the relevant animal species

18 Recognise that the choice of a euthanasia method may influence the scientific outcome

19 Describe appropriate methods and principles for handling animals, and describe common techniques / procedures, including administration and sampling techniques

20 Describe where to find relevant and up-to-date information about refinement of animal experiments

21 List the different types of formal experimental designs
22 Identify the experimental unit
23 Describe the variables affecting significance, including the meaning of statistical power and the "p-value"
24 Describe how to monitor the microbiological health of laboratory animals
25 Describe the terms sedation, local anesthesia and general anesthesia
26 Describe the components of pain physiology and list the types of analgesic drugs that are effective at the different components
27 Define the term "Balanced anesthesia" and indicate methods to achieve this
28 Describe how to do pre-operative, intraoperative and post-operative evaluation of research animals
29 Describe different methods to optimize post anesthetic recovery
30 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

Lecture

Extra information on the teaching methods

The theoretical teaching will happen partly as self-studies using e-based learning tools with tests and assignments, and partly as auditorium lectures.
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 each course module. Completion of tests and assignments is mandatory. The deadline will be given around the start of the course.
Persons who will work with fish or aquatic animals will need to have their practical training supervised by persons with appropriate and up-to-date competence within the species and the techniques that the students will use in their future research. Practical training must be documented. Mandatory lectures are required for fish specialization.

Learning materials and price

The course syllabus will be the course 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.

References

As supportive literature, a text book in laboratory animal science is recommended. For example; "The UFAW handbook on The Care and Management of Laboratory and Other Research Animals", Eighth Edition, 2020, Edited by Robert Hubrecht and James Kirkwood.

Course content-related study coaching

Assessment moments

end-of-term assessment

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

Written examination, Assignment

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

Written examination, Assignment

Examination methods in case of permanent assessment

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

The exam includes a written exam (home or normal) and an assignment. 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.