GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2022-2023

Applied Animal Genetics (I002745)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

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

Credits 5.0 **Study time 150 h** **Contact hrs** 50.0 h

Course offerings and teaching methods in academic year 2022-2023

A (semester 1)	English	Gent	lecture	22.5 h
			lecture: plenary exercises	22.5 h
			self-reliant study activities	5.0 h

Lecturers in academic year 2022-2023

De Smet, Stefaan	LA22	lecturer-in-charge

Offered in the following programmes in 2022-2023	**crdts**	**offering**
Master of Science in Bioscience Engineering: Agricultural Sciences	5	A
Exchange Programme in Bioscience Engineering: Agricultural Sciences (master's level)	5	A
Exchange Programme in Bioscience Engineering: Cell and Gene Biotechnology (master's level)	5	A

Teaching languages

English

Keywords

Animal genetics, farm animals, quantitative genetics, breeding programs, breeding value estimation, selection, genomics

Position of the course

The aim of this course is to gain insight into the different elements of breeding programs in farm animals and their interrelationships. The emphasis is on the application of principles of genetics in models and methods for the genetic adaptation of quantitative traits in farm animals. In addition, practical aspects of breeding programs and new developments in this area (use of molecular genetics) are also discussed.

Contents

In the lectures, theory and exercises are dealt with interactively. Theoretical aspects are introduced and are subsequently elaborated making use of calculation exercises with small datasets. The contents are progressively dealt with, whereby each chapter builds upon or makes use of the previous chapters.
1. Population genetics
2. Genetic relationships
3. Qualitative and quantitative traits, genetic models
4. Estimation of genetic parameters
5. Breeding value estimation
6. Selection, crossbreeding, inbreeding, breeding programs
7. Use of molecular genetics in animal breeding

Guest lectures are given by representatives from breeding organisations.
There is a paper reading and discussion task on a hop topic.

Initial competences

Have basic knowledge of genetics, statistics and animal production.

Final competences

1 Have insight in breeding programmes that are applied to farm animals, and in the constituent elements (a.o. breeding value estimation, selection, crossbreeding)
2 Have insight in genetic models that are used in breeding of farm animals for estimating genetic parameters and breeding values.
3 Link the various elements of genetic improvement.
4 Apply the calculation models that are used in animal breeding.
5 Know the developments in the field of quantitative and molecular genetics, and how this affects animal breeding.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Lecture, self-reliant study activities, lecture: plenary exercises

Extra information on the teaching methods

In the lectures, theory and plenary exercises are dealt with interactively. Theoretical aspects are first introduced and are subsequently elaborated making use of calculation exercises with small datasets. The plenary exercises are coached and are partly performed on PC.

Learning materials and price

Lecture notes are available. The calculation exercises are available on paper. Use is made of freely available software in the field of animal genetics and from conventional statistical programmes. All study material is available on Ufora.

References

Falconer D.S. (1989). Introduction to Quantitative Genetics, 3rd ed. Longman Group UK, Harlow, England
Griffiths A.J.F., Miller J.H., Suzuki D.T., Lewontin R.C., Gelbart W.M. (1996). An Introduction to Genetic Analysis, 6th ed. W.H. Freeman and Company, New York
Hammond K., Graser H.-U., McDonald C.A. (1992). Animal Breeding. The Modern Approach. University of New England, Armidale, Australia
Mrode R.A. (1996). Linear Models for the Prediction of Animal Breeding Values. CAB International, Wallingford, Oxon, UK

Course content-related study coaching

The students are actively involved in the calculation exercises and the lectures. During the contact hours, the lecturer is available for questions. Additional information can always be requested via e-mail.

Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination, open book examination, oral examination

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

Written examination, open book examination, oral examination

Examination methods in case of permanent evaluation

Oral examination, participation

Possibilities of retake in case of permanent evaluation

not applicable

Extra information on the examination methods

Period-aligned evaluation:
Oral exam with written preparation. The written part consists of 1/ 4-6 closed book questions that are a combination of short open and multiple choice questions for evaluating basic knowledge, and 2/ 2-3 open book questions that are calculation exercises aiming at evaluating insight. The lecturer discusses the written part with the student (= oral examination part).
Non-period-aligned examination:
Participation to the exercises, paper reading and discussion, and the guest lectures.

Calculation of the examination mark

Period-aligned evaluation: 80% of the final score. The open book and closed book questions have approximately equal weight.
Non-period-aligned evaluation: 20% of the final score. Participation to the paper reading and discussion, and the guest lectures is obligatory.