Swedish University of Agricultural Sciences

P000016, Understanding infectious diseases by fusing epidemiology, genetics and modelling, 3.0 Hp

Syllabus

Finalized by: FUN, 2022-11-14

Valid from: 2022H

Level within study regulation:

Third cycle

Subject:

- Animal science

Grading scale:

Pass / Failed

Course language:

Swedish

Entry requirements:

Admitted to a postgraduate program in animal science or veterinary medicine, medicine, biology or modelling, or to a residency program in veterinary science.

Objectives:

On completion of the course, students should be able to

- understand and apply the basic principles of epidemiology, genetic analyses of disease data and epidemiological modelling
- understand challenges and opportunities for genetic and epidemiological analyses and modelling of infectious disease data
- evaluate different epidemiological prediction models and the potential impact of genetic selection for increased disease resistance or resilience
- assess the potential for genetic studies on disease resistance in livestock using field data and interpret the results of such studies in the context of population specific parameters

Content:

The course is expected to provide advanced knowledge concerning infectious diseases and how epidemiology and genetics can be combined to study and handle such diseases. Focus is on the collection, curation, phenotypic analysis, modelling and genetic analysis of experimental and field data of infectious diseases in livestock, and humans. Infectious disease data are incomplete by its very nature and the course will clearly outline all the challenges related to handling these data and how to make meaningful inferences and prediction models. The course has a One Health perspective and it is primarily targeted at PhD students in epidemiology or quantitative genetics. However, PhD student, post-docs and other professionals with a background in animal, veterinary or medical sciences, or applied mathematics with a strong interest in data analyses and mathematical modelling are also encouraged to attend.

Students will read some introductory literature before the course week (2 days). The course week (5 days) consists of a series of lectures, exercises and discussions. Participants will work in groups and data labs during the day to get hands-on experience of the topics covered. R will be used for exercises. The students will also shortly present their own research project during the course. After the course week, the students will make an assignment where they relate knowledge from the course to their own research (2 days). This will be presented at an on-line workshop which ends the course (1 day).

Modes of assessment:

In order to pass, the students need to 1) Give a short presentation about their own research. 2) Attend all of the provided lectures, tutorials and discussion groups. 3) Successfully complete at least 30% of the in-course exercises. 3) Perform and present an assignment

and participate on-line when the assignments are presented. - If a student has failed an examination, the examiner has the right to issue supplementary assignments. This applies if it is possible and there are grounds to do so.

- The examiner can provide an adapted assessment to students entitled to study support for students with disabilities following a decision by the university. Examiners may also issue an adapted examination or provide an alternative way for the students to take the exam.
- If this syllabus is withdrawn, SLU may introduce transitional provisions for examining students admitted based on this syllabus and who have not yet passed the course.
- For the assessment of an independent project (degree project), the examiner may also allow a student to add supplemental information after the deadline for submission. Read more in the Education Planning and Administration Handbook.

Organisation:

Department of Animal Breeding and Genetics

Supplementary information

Other information:

- The right to participate in teaching and/or supervision only applies for the course instance the student was admitted to and registered on.
- If there are special reasons, students are entitled to participate in components with compulsory attendance when the course is given again. Read more in the Education Planning and Administration Handbook.