Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

SLUkurs

Syllabus

PFG0046 Advanced Linear Model and ASReml, 6.0 credits

Syllabus approved

2015-07-02

Subjects

Biology

Education cycle

Third cycle

Grading scale

Pass / Failed
The requirements for attaining different grades are described in the course assessment criteria which are contained in a supplement to the course syllabus. Current information on assessment criteria shall be made available at the start of the course.

Language

English

Prior knowledge

Basic statistics and genetics or equivalent

Objective, including learning outcomes

The course will cover the general and advanced concept of linear model and use of ASReml for plant and animal breeding and the latest developments in quantitative genetic analyses. By the end of the course, students will be able to:

• Understand the linear mixed models theory and applications to plant and animal breeding
• Estimate variance components and calculate functions of variance components (e.g., heritability, genetic correlations) from complex statistical models including spatial and competition models
• They will be able to estimate genetic relationships between individuals using pedigree and DNA markers
• Participants will learn computing skills and software
• They will be able to analyze large and complex data for predictions of genetic merit using ASReml

Content

1. Basic linear mixed model
2. ASReml system and syntax
3. Variance components, heritability and selection
4. Linear mixed models theory
5. Variance-covariance structures in mixed models
6. Genetic relationships among individuals
7. Breeding values (Additive)
8. Breeding values (Non-additive)
9. Multivariate models, correlated response
10. Spatial Analysis
11. Competition models
12. Modeling genotype by environment and analysis of multi-environment trials

Requirements for examination

Quiz (40%) and final assignments (60%)

Additional information

Implementation
Scheduled activities:
Lectures and software demonstration 40 (5 days)
Examination and course evaluation 15 h
Self studies 50 h
Totally 105 h

Responsible department

Department of Forest Genetics and Plant Physiology