



Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

SLUkurs

Syllabus

PVG0018 The design of biological experiments, 1.5 credits

Syllabus approved

2011-05-10

Subjects

Pathobiology

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

The course is intended for Doctoral, Licentiate or Masters students. No special prerequisites are needed to attend the course.

Objective, including learning outcomes

The purpose of this course is to develop basic understanding of experimental design and data analysis as they apply in particular to biology, as well as providing the

practical and intellectual skills associated with effectively designing and carrying out biological experiments.

Content

A detailed knowledge of experimental design and practice is essential to an understanding of science. Whether in academia, industry, government or elsewhere, a scientist today is expected to be able to reflect upon and assess the professional undertakings of science, which include the quality and effectiveness of the experimental designs used. This course covers the fundamentals of designing biological experiments.

The course covers the following topics:

Scientific thinking and the principles of biological experimentation

The essential steps in experimental design and analysis, and their various roles

The sources of experimental variability, and the ways of effectively dealing with them

The logic of experimental hypothesis testing

The differences between manipulative and descriptive experiments

The practical differences between laboratory and field experiments

The value of exploratory data analysis and power analysis

The effectiveness and limitations of data presentation via graphs and tables

The logic of statistical hypothesis testing

The role of the various forms of statistical data analysis

Alternative forms of data analysis

Reading and critically evaluating the experimental design, data presentation and analysis of scientific papers.

Requirements for examination

Attendance and participation at lectures and in discussions, and presentation of one written assignment

Additional information

Application: Anna Lundén, Anna.Lunden@slu.se

For further information about the course content: David Morrison, David.Morrison@slu.se

The course is given within the Research School for Food and Feed Safety and Quality. It is open for all PhD-students with the prerequisites, but students from

the Research School have priority. Maximum 20 students and the course will only be given if five or more students participate. The course consists of lectures and discussions (2x2,5h sessions/day 8-12 April 2013) + reading and writing an assignment. Knowledge in basic statistics is recommended. Maximum 20 participants.

Course leader David Morrison.

Responsible department

Department of Biomedical Sciences and Veterinary Public Health