



Sveriges lantbruksuniversitet  
Swedish University of Agricultural Sciences

# SLUkurs

## Syllabus

**PNS0054 Multivariate Analysis for Data from Chemistry and Biology,  
7.5 credits**

## Syllabus approved

2009-11-18

## Subjects

Chemistry/Biology/Forest Management/Technology

## 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

MSc or PhD students in chemistry, biology, forestry, engineering, energy science

## Objective, including learning outcomes

Learning to deal with multivariate data (data matrices, data arrays) having correlated variables and using tools to reach the three major objectives: exploration,

classification and regression.

After the course the students will be able to:

- analyze a large data set
- identify and deal with bad, outlier and missing data
- calculate a multivariate regression model and study its diagnostics
- visualize and study residuals
- deal with higher-way (3-Way) data
- use software for multivariate data analysis
- select and judge a sampling technique based on the requirements of multivariate data analysis
- select useful variable subsets

### **Content**

data structures, geometry of multivariate space, principal component analysis, factor analysis, latent variable based regression models, missing and bad data, exploratory data analysis, classification, prediction, visualization of results, temporal and spatial data, algorithms

### **Requirements for examination**

oral exam / home exam

### **Additional information**

This is a self-study course. The lecture/exercise/discussion sessions are concentrated in blocks and between the blocks reading and calculation assignments are given. Experienced guest lecturers will be used for some topics.

### **Responsible department**

Department of Forest Biomaterials and Technology