



Exchange programme Vrije Universiteit

Vrije Universiteit Amsterdam - Exchange programme Vrije Universiteit - 2022-2023

Exchange

Vrije Universiteit Amsterdam offers many English-taught courses in a variety of subjects, ranging from arts & culture and social sciences, neurosciences and computer science, to economics and business administration.

The International Office is responsible for course approval and course registration for exchange students. For details about course registration, requirements, credits, semesters and so on, please [visit the exchange programmes webpages](#).

Statistics and Methodology

Course Code	AB_1201
Credits	6.00
Period	P4
Course Level	300
Language Of Tuition	English
Faculty	Faculty of Science
Course Coordinator	E. Vlemincx
Examiner	dr. J.J. Stunt
Teaching Staff	mr. R.P.O. Porneso, H.R. Zoomer, J.E. Savage, dr. S. van der Sluis, E. Vlemincx
Teaching method(s)	Study Group, Partial Exam, Lecture, Computer lab

Course Objective

In the courses 'Introduction to Biomedical Sciences' and 'Research in Biomedical Sciences', the groundwork for the course 'Statistics and Methodology' was laid by generating statistical knowledge, understanding and skills in statistical reasoning. The overall goal of Statistics and Methodology is to broaden and especially deepen this knowledge, with a special focus on statistical reasoning, and the critical evaluation of methods and techniques.

In the first part of the course, knowledge on statistical analyses will be broadened by introducing a selection of new statistical techniques including analysis of variance and regression analysis. The second part of the course will include an in-depth discussion of methodological and statistical quality, and a critical reflection on the strengths and limitations of traditional statistics.

Throughout the course, the student will gain skills in the analysis and evaluation of (scientific) reasoning. Students are expected to have achieved the learning outcomes of RBMS to be able to swiftly understand and apply new statistical techniques, and take a critical perspective on the process of null hypothesis testing and statistics.

After this course, students are able to

- critically analyze the way measurements have come about, and the consequences this has for their statistical analysis,
- present data in graphical form,
- assess whether presented data fulfil the conditions of a specific statistical analysis,
- select an appropriate statistical test, given an experimental design within the scope of one of the following statistical analyses: all statistical tests introduced in RBMS (z-tests, chi-square tests, t-tests and correlation tests), analysis of variance (one- and two-way ANOVA) and (multiple) linear regression analysis,
- autonomously conduct these statistical analyses in statistical software (SPSS),
- interpret the results of these analyses,
- understand the importance of power and determine power using power software (Gpower),
- critically review methodological and statistical quality of published articles.

Course Content

Students will gain knowledge, understanding and skills on:

- general linear models (one-way and two-way analysis of variance and (multiple) linear regression),
- conducting analyses in statistical software (SPSS and Gpower),
- systematic review and meta-analysis,
- scientific integrity in research practices,

- critical analysis and review of the methodological and statistical quality of research articles.

Additional Information Teaching Methods

- Lectures: on average 2 hours a week

- Work groups: on average 4 hours a week

During the first part of the course, work groups will consist of integrated work groups and computer practicals during which students will be supervised while independently conducting statistical analyses on their own laptop using SPSS or Gpower.

During the second part of the course, work groups will involve small and large group practical sessions during which students will be trained to critically assess methodological and statistical quality of research papers, to successfully complete a peer review assignment.

Method of Assessment

- One partial exam (digital, closed book, multiple choice and open question, using SPSS) counts towards 50% of the total grade.

- A group assignment consisting of a peer review report counts towards 50% of the total grade.

If the exam grade is insufficient, students will partake in a resit exam, counting towards 50% of the total resit grade.

If the assignment grade is insufficient, students will retake the assignment, counting towards 50% of the total resit grade.

Entry Requirements

To be admitted to this course, students must have participated in the course 'Research in the Biomedical Sciences'.

Literature

- The following textbook (the same one as used in IBMS and RBMS):

"The practice of Statistics in the Life Sciences" by Brigitte Baldi and David S. Moore (Fourth (or Third) edition). ISBN-13:978-1-319-18760-6. The fourth edition is advised. The first edition has become inadequate.

- Additional course materials will be made available through Canvas.

Additional Information Target Audience

Compulsory course for second-year BSc Biomedical Sciences students.