Advanced Applied Statistics (C003812)

Course Specifications
Valid as from the academic year 2016-2017

Course offerings and teaching methods in academic year 2019-2020
A (semester 2) English lecture 15.0 h
seminar: practical PC room classes 25.0 h

Lecturers in academic year 2019-2020
Vanreusel, Ann WE11 lecturer-in-charge
Sabbe, Koen WE11 co-lecturer

Offered in the following programmes in 2019-2020
Master of Science in Marine and Lacustrine Science and Management 3 A

Teaching languages
English

Keywords
Descriptive statistics, design of an experiment, ANOVA, regression, Cluster and ordination

Position of the course
To teach in theory and practice the basic statistical analysis that are most frequently used in quantitative aquatic ecological research.

Contents
The purpose of the course is to introduce some frequently applied univariate and multivariate statistical methods in quantitative research for students with only elementary mathematical background. The theoretical part is focused on the application and the interpretation of the analysis. The practical exercises aim to get familiar with statistical programs and free software R in order to apply these techniques and discuss the results in a correct and extensive way. The techniques dealt with are parametric ANOVA, correlation analysis and non parametric alternatives, Multiple regression, and multivariate analysis like cluster techniques, MDS and PCA.

Initial competences
• Basic statistical principles of distributions and probabilities.
• Excel

Final competences
The most widely used uni- and multivariate statistical techniques in ecological orientated research.

Conditions for credit contract
Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract
This course unit cannot be taken via an exam contract

Teaching methods
Lecture, seminar: practical PC room classes

Extra information on the teaching methods

(Approved)
Theoretical classes followed by PC classes to practice in Excel and R software (use of software, application and interpretation)

Learning materials and price
- Course notes 7 EURO
- Minerva
- Electronic handbooks

References
- ZAR JH Biostatistical analysis

Course content-related study coaching
- Assistance during practical exercises
- Feedback through Minerva

Evaluation methods
- end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period
- Written examination

Examination methods in case of periodic evaluation during the second examination period
- Written examination

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation
- not applicable

Extra information on the examination methods
- The examen consists of several questions which are mainly practical orientated but needs to be solved written (not on a computer)
- In general there are three types of questions
1. Give definitions or explain background of techniques (without formulas)
2. Interpret in a complete and correct way the output of statistical tests
3. Identify correct experimental designs and statistical analysis in order to test particular hypothesis

Calculation of the examination mark
- written exam: 100%