### Course Specifications

**Valid as from the academic year 2016-2017**

**Advanced Applied Statistics (C003812)**

<table>
<thead>
<tr>
<th>Course size</th>
<th>(nominal values; actual values may depend on programme)</th>
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</thead>
<tbody>
<tr>
<td>Credits</td>
<td>3.0</td>
</tr>
<tr>
<td>Study time</td>
<td>90 h</td>
</tr>
<tr>
<td>Contact hrs</td>
<td>39.0 h</td>
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</tbody>
</table>

**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**
  - credits: 3
  - offering: 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 though 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%