Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	Advanced Statistics
Course code	46001
Scientific sector	SSEC/S-02
Degree	PhD in Sustainable Energy and Technologies / PhD in Mountain Environment and Agriculture
Semester	1
Year	1
Academic year	2016/2017
Credits	3
Modular	No

Total lecturing hours	20
Total lab hours	-
Total exercise hours	-
Attendance	Yes
Prerequisites	Basic knowledge of statistical methods as in Bachelor- or Master-thesis
Course page	

Specific educational objectives	The course is designed for acquiring professional skills and knowledge in the area of statistics. The students will be enabled to independent treatment of statistical research issues. Data analysis of typical research problems will be done in R or SPSS.

Lecturer	Hermann Atz
Scientific sector of the lecturer	
Teaching language	English
Office hours	-
Teaching assistant *(if any)*	-
Office hours	-
List of topics covered	The topics treated include: Recapitulation of basic statistical concepts Descriptive statistics (measures of location and dispersion); Distributions Graphical representation of data Contingency tables Correlation and linear regression Hypothesis testing Fundamentals of modelling Multiple testing and the corresponding correction methods Graphical presentation of higher dimensional data

	Multivariate regression, linear and polynomial Analysis of variance including interaction Factor analysis Topics according to request
Teaching format	Frontal lectures, exercises with notebooks

Learning outcomes	Knowledge and understanding Knowledge of the most important statistical methods for data analysis; understanding their rationale, conditions of usage and their results. Applying knowledge and understanding Identification of appropriate statistical method for data analysis; independent identification and application of functions in statistical package R. Making judgements Critical reviewing of own scientific work and of original publications; interpretation of statistical analyses in the context of diverse scientific fields . Communication skills Ability to present results of statistical analyses correctly and intelligibly. Learning skills Ability to recognize situations in which statistical analysis is necessary. Ability to judge the appropriateness of statistical methods.
Assessment	Collaboration in exercises
Assessment language	English
Evaluation criteria and criteria for awarding marks	

Required readings	
Supplementary readings	For example: Moore, David S. (1991), Statistics: concepts and controversies, 3rd ed., New York: W.H. Freeman and Company Muenchen, Robert A. (2011), R for SAS and SPSS Users, 2nd ed., New York et al.: Springer Qian, Song S. (2010), Environmental an ecological statistics with R, New York: Taylor & Francis Group Ross, Sheldon M. (2004), Introduction to probability and statistics for engineers and scientists, 3rd ed., Amsterdam et al.: Elsevier Academic Press