PhD MANAGEMENT  
Experimental and Simulation Methods (390013)  
o. Univ.-Prof. Dipl.-Ing. Dr. Dr. h. c. Udo Wagner  
Univ.-Prof. Dipl.-Kff. Dipl.-Psych. Dr. Nicole Koschate-Fischer  

SS 2015

University’s regulations require a minimum number of students enrolled to a particular course as a prerequisite for its authorization. At the present time it is unclear whether there will be such a sufficient number of students being interested to take this course during the upcoming semester. Thus, this instruction sheet is preliminary.

1. Target Group

Students of the PhD-Program in Management  
This course is part of the core program of the curriculum PhD management, see:  
http://ssc-wirtschaftswissenschaften.univie.ac.at/fileadmin/user_upload/ssc_wiwi/ssc/curricula/phd_management_program.pdf  
Students are required to have passed Management Decision Making, Multivariate Business Statistics and Philosophy of Science successfully.

2. Organizational Issues

- 2 Hours, 10 ECTS credits  
- Language of Instruction: English  
- Limited number of participants (max. 15)  
- **Part Prof. Wagner: Time to be agreed upon, Room to be announced** (There will be 7 meetings in class, each will last 2 academic hours, and one written exam)  
- **Preliminary meeting: March 4th, 2015, 9:00,**  
  Room 05.627, 5th floor, Oskar Morgenstern Platz 1, 1090 Vienna  
- Students are required to register via the UNIVIS-System

3. Course Content and Course Objectives

This course introduces experimental design and the statistical analysis of experimental data. In the first part (Instructor Prof. Koschate-Fischer), we will discuss the usefulness of experiments for testing research hypotheses. We will explore the different questions arising while conceptualizing and implementing experiments in various environments. This includes the determination of the research setting and the experimental design, as well as questions regarding samples, incentives, and deception. The workshop is designed to be interactive and it will be illustrated with examples taken from recent publications and small case studies to promote understanding. A final case study in which students apply the key issues of the workshop by designing and presenting an experimental approach to a research question will close the first part of the course.

In the second part (Instructor Prof. Wagner), appropriate statistical methods will be
presented which are suited for analyzing data collected by means of experimental research projects. We will differentiate according to the level of measurement of the dependent variable and further between the designs of the experiment (i.e., between-subjects vs. within-subjects). In order to be able to perform statistical analysis on empirical data examples will be provided as to how SPSS implements the techniques presented. Students have to conduct statistical analysis on an individual data set during the second part of the course and to provide a written report about this project. Finally, an introduction to simulations methods (focusing on human behavior) will be provided.

After passing this course students should be able to design research projects of their own and to analyze the data generated therefrom.

4. Course Grades

Since not all of the material can be discussed in class, students are expected to prepare for class sessions by studying the relevant literature (see Readings-section). Regular class attendance is expected.

Course grades will be based on various requirements, with the following weights:
- Part Prof. Koschate-Fischer 50 %
- Exam (Part Prof. Wagner) 40 %
- Data analysis project (Part Prof. Wagner) 10 %

5. Readings

Copies of the Power Point presentation will be made available on the „MOODLE“ platform.

Part Prof. Wagner


Further Readings

Bühl Achim (2012) SPSS 20 – Einführung in die moderne Datenanalyse, 13. Auflage, Pearson. [http://amzn.to/1x0Z88N](http://amzn.to/1x0Z88N)

Part Prof. Koschate-Fischer


Further Readings


6. Preliminary Time Schedule

Prof. Koschate-Fischer

<table>
<thead>
<tr>
<th>Date, Place</th>
<th>Content</th>
</tr>
</thead>
</table>
| April 21
  8:00 –12:00  | Introduction  
SR 4  
The Basics of Experimental Research  
Central Decisions in Designing Experimental Studies, Part 1:  
  - How to determine the research setting?  
  - How to specify the experimental design I (Which independent variables should be included and how to manipulate them?) |
| April 22
  8:30 –12:30  | Central Decisions in Designing Experimental Studies, Part 2:  
SR 4  
  - How to specify the experimental design II (Which experimental design should be chosen and how to derive the statistical method for data analysis from the experimental design?)  
  - Which and how many participants should be included?  
  - How to vary the independent variables and how to measure the dependent variables? |
| April 23
  8:30 –12:30  | Central Decisions in Designing Experimental Studies, Part 3:  
SR 1  
  - How to provide incentives for participation and information on the experiment?  
  - Summary  
  Case Study & Presentation |

Prof. Wagner

<table>
<thead>
<tr>
<th>Date</th>
<th>Content</th>
</tr>
</thead>
</table>
| 27.4.  
SR 2  | Basic terminology: experimental design and statistics  
Discrete dependent variables: cross tabulations, Chi-square tests, log-linear models, logistic regression, Correspondence analysis, McNemar’s change test  
  TF1 10, 16  
  BEPW 5, 6, 15  
  BEW 7  
  TF2 1, 2  
  EWV |
<table>
<thead>
<tr>
<th>Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.5. SR 6</td>
<td>Ordinal dependent variables: Mann-Whitney U Test, Wilcoxon T Test,</td>
</tr>
<tr>
<td></td>
<td>Kruskal-Wallis H Test, Friedman Test</td>
</tr>
<tr>
<td></td>
<td>TF1 10, 16</td>
</tr>
<tr>
<td>18.5. 01.6.</td>
<td>Basic terminology: t-Test, effect sizes, interaction effects,</td>
</tr>
<tr>
<td>SR 2</td>
<td>contrasts, post-hoc tests</td>
</tr>
<tr>
<td></td>
<td>Continuous dependent variable, independent samples, covariates:</td>
</tr>
<tr>
<td></td>
<td>ANOVA (one way, n-ways), ANCOVA</td>
</tr>
<tr>
<td></td>
<td>TF2 3-5, BEPW 3, EWRP</td>
</tr>
<tr>
<td>08.6. 15.5.</td>
<td>Continuous dependent variable, dependent samples/repeated measures,</td>
</tr>
<tr>
<td>SR 2</td>
<td>covariates: ANOVA (n-ways), ANCOVA</td>
</tr>
<tr>
<td></td>
<td>TF2 6, 7</td>
</tr>
<tr>
<td>22.6. SR 4</td>
<td>Some introduction in simulation for analyzing human behavior</td>
</tr>
<tr>
<td></td>
<td>HHL 15, WG, WRG</td>
</tr>
<tr>
<td>29.6. PC SR</td>
<td>Exam (Part Prof. Wagner)</td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>