inf972 - Fundamental Competences in Psychology III: Experiments and Studies

**Module label**
Fundamental Competences in Psychology III: Experiments and Studies

**Module code**
inf972

**Credit points**
6.0 KP

**Workload**
180 h

**Used in course of study**
- Master's Programme Engineering of Socio-Technical Systems > Fundamentals/Foundations

**Used in course of study**
- Master's Programme Engineering of Socio-Technical Systems

**Contact person**
Module responsibility
- Susanne Boll-Westermann

**Authorized examiners**
- Die im Modul Lehrenden

**Entry requirements**
The module inf972 Fundamental Competences in Psychology III: Experiments and Studies forms a basic curriculum in the MSc Engineering Socio-Technical Systems for students with a degree in computer science to complement their scientific education in the field of designing, planning and carrying out scientific experiments and studies. The course focuses on methods for studying human machine interaction in socio-technical systems as they are addressed in this MSc degree.

The module introduces on standard methods of scientific experiments. The module is based on standard introductory text books in Psychology, as for example the standard text book "Das psychologische Experiment, Eine Einführung, Osswald Huber, 2005" (will be taught in English of course) or in the standard textbook in the field of Human Computer Interaction: Research Methods in HCI, Jonathan Lazar, Jinjuan Heidi Feng, Harry Hochheiser, John Wiley and Sons Ltd, 2009.

With this module, students with a background in Computer Science can complement their expertise in the field of scientific experiments and methods and provide them with a basis knowledge in this area. It will give them prerequistes to jointly attend courses and get practical assignments in later terms of their studies together with the students with a background in psychology for whom the methods and tools for scientific experiments are part of their BSc studies.

This module provides students without prior knowledge of designing, planning, and carrying out scientific experiments and studies with the basic knowledge in that field as relevant for mastering subsequent modules in the curriculum. The course is compulsory for students featuring a background in computer science and lacking fundamental competences in psychology. It is not intended for students already featuring a background in psychology.

**Skills to be acquired in this module**
- Professional competences:
- Methodological competences:
The students are introduced into the design, implementation and also the analysis and interpretation of experiments.

- Social competences:
- Self-competences:
The students have knowledge of the tools and methods used for experiment design and evaluation. They are able to choose the right methods for their specific experiment. They are able to design and run experiments.

**Module contents**
Content of the module:
Introduction into experimental psychology
- Variables, dependent and independent variables
- Formulating Hypotheses / Hypothesis testing
- Correlation and Cause
- Quantitative and qualitative methods
- Surveys, Experiments, Observational Studies

Experiment design / Study designs
- Between-Subjects Experiments
- Within-Subjects Experiments
- Randomized Control Trials
- Practical Considerations
- Complex Research Designs
• Single-Subject Research
• Lab studies vs. Studies in the wild
• Single factor vs. multifactor designs

Participants
• Recruiting participants
• Participants sampling
• Randomization
• Power Calculation

Tools
• SoSci Survey for online survey
• Statistic Tools

Analysis
• Descriptive Statistics
• Descriptive statistics and Correlation coefficients
• Statistical analysis of the data
• Internal and external validity

Ethics
• Institutional Review Boards
• Informed Consent

The module consists of a lecture and an exercise part:
Lecture: Theoretical introduction into the concepts and scientific methods of experiment design.
Exercises: Deepening the understanding of the experiments by planning and carrying out a survey and an experimental study in teams over the course of the term.

Reader’s advisory

• Das psychologische Experiment, Eine Einführung, Osswald Huber, 2005
• How to Design and Report Experiments, Andy Field, sage 2003
• Research Methods in HCI, Jonathan Lazar, Jinjuan Heidi Feng, Harry Hochheiser, John Wiley and Sons Ltd, 2009
• Allgemeine Psychologie, Müsseler, Jochen, Berlin ; Heidelberg: Springer, 2017

Links
Language of instruction: English
Duration (semesters): 1 Semester
Module frequency: once a year
Module capacity: unlimited
Reference text: This module provides students without prior knowledge of designing, planning, and carrying out scientific experiments and studies with the basic knowledge in that field as relevant for mastering subsequent modules in the curriculum. The course is compulsory for students featuring a background in computer science and lacking fundamental competences in psychology. It is not intended for students already featuring a background in psychology.

Modullevel: BC (Basiscurriculum / Base curriculum)
Modulart: Pflicht o. Wahlpflicht / compulsory or optional
Lern-/Lehrform / Type of program: V+Ü
Vorkenntnisse / Previous knowledge:

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<tr>
<th>Examination</th>
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<th>practical work and oral exam</th>
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<td>At the end of the lecture period</td>
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<td>Lecture</td>
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<tr>
<td>Exercises</td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
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Total time of attendance for the module: 56 h