inf966 - Foundations of STS Eng.: Statistics and Programming

**Module label**: Foundations of STS Eng.: Statistics and Programming  
**Module code**: inf966  
**Credit points**: 6.0 KP  
**Workload**: 180 h  
**Used in course of study**: Master's Programme Engineering of Socio-Technical Systems > Fundamentals/Foundations  
**Contact person**:  
  - Antje Timmer  
  - Andreas Hein  
**Module responsibility**  
  - Die im Modul Lehrenden  
**Entry requirements**
**Skills to be acquired in this module**
**Professional competences:**
The students learn:
To plan, program and interpret statistical data evaluation via programming.

**Methodological competences:**
The students:
- understand the main statistical methods and their practical use through application  
- can evaluate statistical methods regarding the qualities and their limits  
- learn the use of statistical software in application scenarios  
- can implement programs via a programming language  
- know how to program statistical data analyses  

**Social competences:**
The students gain experience in interdisciplinary work.

**Self-competences:**
The students gain experiences in
- Pursuing goals: Thinking, problem solving and acting  
- Ability to analyze and evaluate the effects and relevance of datasets for specific research questions

**Module contents**
The module consists of a lecture and an exercise part:
Lecture: Introduction to the concepts and methods for computer supported statistically data evaluation. Special emphasis is put on statistically methodical as well as on a basic understanding of programming languages.
1. Fundamental Computer Science Concepts in regard to the handling of imperative programming languages including:
   - variable types and variable handling  
   - typical code structures (such as "while / for loops" or "if-then else" statements)  
   - data-handling and computation approaches
2. Fundamental static methodology such as:
   - estimating parameters through the method of maximum likelihood  
   - confidence intervals and classical significance testing  
   - classical regression analysis  
   - modern advancements in regression analysis

**Exercises:** Stepwise practical or paper based use of the learned concepts, methods and tools.

**Reader's advisory**

**Links**
**Language of instruction**: English  
**Duration (semesters)**: 1 Semester  
**Module frequency**: Once a year
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<th>Module capacity</th>
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<tr>
<td>Modullevel</td>
<td>BC (Basiscurriculum / Base curriculum)</td>
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<td>Modulart</td>
<td>Pflicht o. Wahlpflicht / compulsory or optional</td>
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<td>Lern-Lehrform / Type of program</td>
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<td>Vorkenntnisse / Previous knowledge</td>
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<th>Written or oral exam</th>
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<tr>
<td>Exercises</td>
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