### Module Label
Fundamental Competences in Computing Science III: Algorithms and Computational Problem Solving

### Module Code
inf962

### 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

#### Module Responsibility
- Lehrende der Informatik

#### Authorized Examiners
- Die im Modul Lehrenden

### Entry Requirements

### Skills to be acquired in this module
The students acquire a thorough understanding of the fundamental methods of computer science in general and the use of algorithms for computational problem solving in particular. They learn how structure problems, model problems and solutions, and develop and implement computational solutions. Within the curriculum of the MSc EngSTS, this course provides students featuring a BSc in psychology or related subjects with fundamental skills in computational problem solving that are necessary for mastering subsequent courses in computer science.

#### Professional competences:
The students understand concepts for representing information computationally, they know pertinent data structures and algorithms and can argue about their complexity, and they are acquainted with formal concepts like automata and formal languages as a means of modeling

#### Methodological competences:
The students are able to analyze problems from their application domain, to conceive computational solutions, and to estimate the effort involved in their realization and execution. They are able to evaluate alternative computational representations of data and problems and to draw informed conclusions for subsequent decisions in design and implementation

#### Social competences:
The students:
The students are able to present and discuss their solutions in an interdisciplinary team

#### Self-competences:
The students are able to critically reflect fundamental design decisions in algorithms and data structures

### Module Contents
Computer representation of information; formal languages, grammar and automata; basic data structures; algorithms and complexity; programming in the small

### Reader's Advisory

#### Language of instruction
English

#### Duration (semesters)
1 Semester

#### Module frequency
once a year

#### Module capacity
unlimited

#### Reference text
This course is part of the base curriculum of the MSc program "Engineering of Socio-Technical Systems". It provides students featuring a background in psychology with skills in computational problem solving as necessary for mastering subsequent courses in computer science. This course is not intended for students with a background in computer science

### Modullevel
BC (Basiscurriculum / Base curriculum)

### Modulart
Pflicht o. Wahlpflicht / compulsory or optional

### Lern-/Lehrform / Type of program
V+Ü

### Vorkenntnisse / Previous knowledge
Knowledge of a programming language may be helpful, but is not required

### Examination

#### Time of examination
At the end of the lecture period

#### Type of examination
Hands-on exercises and written exam or Hands-on exercises and oral exam

### Final exam of module

#### Course type

<table>
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<tr>
<th>Lecture</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
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<td>Exercises</td>
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<td>WiSe</td>
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#### Total time of attendance for the module
56 h