phy678 - Processing and analysis of biomedical data

Module label: Processing and analysis of biomedical data
Module code: phy678
Credit points: 6.0 KP
Workload: 180 h
(Attendance: 56 hrs, Self study: 124 hrs)

Used in course of study:
- Master's Programme Engineering Physics > Schwerpunkt: Acoustics
- Master's Programme Engineering Physics > Schwerpunkt: Biomedical Physics

Contact person:
Module responsibility
- Björn Poppe

Entry requirements:
Basic signal processing, algebra knowledge

Skills to be acquired in this module:
This course introduces basic concepts of statistics and signal processing and applies them to real-world examples of bio-medical data. In the second part of the course, recorded datasets are noise-reduced, analyzed, and discussed in views of which statistical tests and analysis methods are appropriate for the underlying data. The course forms a bridge between theory and application and offers the students the means and tools to set up and analyze their future datasets in a meaningful manner.

Module contents:
Normal distributions and significance testing, Monte-Carlo bootstrap techniques, Linear regression, Correlation, Signal-to-noise estimation, Principal component analysis, Confidence intervals, Dipole source analysis, Analysis of variance. Each technique is explained, tested and discussed in the exercises.

Reader’s advisory:

Links
Language of instruction: English
Duration (semesters): 1 Semester
Module frequency: Wintersemester
Module capacity: unlimited
Modulart: Wahlpflicht / Elective

Exam or presentation or oral exam or homework or practical report

Course type: Lecture
SWS: 4.00
Frequency: SuSe or WiSe
Workload attendance: 56 h