**phy696 - Advanced Topics Speech and Audio Processing**

**Module label**
Advanced Topics Speech and Audio Processing

**Module code**
phy696

**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 counseling
- Simon Doclo

**Entry requirements**
Basic principles of signal processing (preferably successfully completed the course Signal- und Systemtheorie and/or Blockpraktikum Digitale Signalverarbeitung)

**Skills to be acquired in this module**
The students will gain in-depth knowledge on the subjects' speech and audio processing. The practical part of the course mediates insight about important properties of the methods treated in a self-study approach, while the application and transfer of theoretical concepts to practical applications is gained by implementing algorithms on a computer.

**Module contents**
After reviewing the basic principles of speech processing and statistical signal processing (adaptive filtering, estimation theory), this course covers techniques and underlying algorithms that are essential in many modern-day speech communication and audio processing systems (e.g. mobile phones, hearing aids, headphones): acoustic echo and feedback cancellation, noise reduction, dereverberation, microphone and loudspeaker array processing, active noise control. During the exercises a typical hands-free speech communication or audio processing system is implemented (in Matlab).

**Reader's advisory**

**Links**
- Language of instruction: English
- Duration (semesters): 1 Semester
- Module frequency: unlimited
- Module capacity: unlimited
- Modulart: Wahlpflicht / Elective
- Lern-/Lehrform / Type of program: Lecture: 2hrs/week; practical work: 2hrs/week

**Vorkenntnisse / Previous knowledge**

**Examination**
- Time of examination: Exam or presentation or oral exam or homework or practical report
- Type of examination: Final exam of module

**Course type**
- Lecture

**SWS**
- 4.00

**Frequency**
- SuSe or WiSe

**Workload attendance**
- 56 h