Module title Biosignal Processing				
Module code BSV	**Level** Master (M.Sc.)	**Hours per week** 4	**ECTS credits** 5	**Duration** 1 semester
Module instructor Prof. Dr. Doering	**Lecture type** Interactive seminar with integrated exercises	**Prerequisite(s)** Solid programming skills	**Grading** Final exam	

Objectives

- Students are aware of the specific challenges in biosignal processing
- Students know parameters which are relevant for the evaluation of the quality of biosignals and the choice of an appropriate signal model
- Students can apply methods to adapt and analyse linear models for stochastic biosignals and implement such methods in MATLAB®

Content

- Acquisition, quantisation and discretisation of biosignals
- Statistical signal parameters
- Filter design methods, optimal filters, adaptive filters
- Parametric and non-parametric spectral analysis
- Time – Frequency – Analysis
- Methods of Blind Source Separation (Principal Component Analysis, Independent Component Analysis)
- Classification of signals / signal sections

Textbook/teaching material

- Blinowska, Zygierewicz. Practical Biomedical Signal Analysis using MATLAB, CRC Press 2012
- Webster (ed.) Medical Instrumentation. Application and Design. Wiley 2010
- Semmlow, Griffel. Biosignal and Medical Image Processing. CRC Press, 3rd edition 2014
- Liang, Bronzino, Peterson. Biosignal Processing. CRC Press 2013
- Stone. Independent Component Analysis – A Tutorial Introduction. MIT Press 2004

Note: this is not the official course descriptor according to the "Studien- und Prüfungsordnung" (SPO)