



Universität Ulm

Master of Science Physics (PO 2017)

Biophysics of Hearing and Seeing

Code 8812874268

ECTS credits 4

Attendance time 3

Language of instruction English

Duration 1 Semester Semester

Cycle irregular

Coordinator Dean of Physics Studies

Instructor(s) Prof. Heinrich Hoerber

Allocation of study programmes Physics M.Sc., elective module, 1st or 2nd semester
Wirtschaftsphysik M.Sc., elective module, 1st – 3rd semester

Recommended prerequisites None

Learning objectives The course "Biophysics of Hearing and Seeing" will provide a basic understanding of these senses with respect to their anatomy and physiology. In comparison with recent technical developments of optical and acoustic sensor systems, the physical principles to characterize the performance of these senses will be introduced.

Syllabus

- Evolution of seeing
- New developments in imaging and image processing techniques
- Anatomy and Physiology of the Eye
- Comparison between natural and artificial systems
- Introduction to Acoustic
- Anatomy and Physiology of the Ear

- Comparison between natural and artificial systems

Literature

- Anatomy and Physiology of Eye, 2nd Edition 1.12.2008, A.K. Khurana, CBS publishers & Distributors
- Eye and Brain, The Physiology of Seeing, 5th Edition 30.10.1997, Richard L. Gregory, Oxford University Press
- The Evolution of the Eye, 8.10.2015, Georg Glaeser und Hannes F. Paulus, Springer
- Essential Principles of Image Sensors, 12.8.2014, Takao Kuroda, Apple Academic Press
- Hearing. Anatomy, Physiology and Disorders of the Auditory System, Aage R. Moller, Plural Publishing, 1.10.2011
- Fundamentals of Hearing, William Yost, Academic Press, 2.10.2006

Teaching and learning methods

Lecture with exercises, block course

Workload

60 hours lecture with exercises (attendance time)

60 hours self-study and exam preparation

Total: 120 hours

Assessment

The grade of the module will be the grade of the oral exam. No prerequisites are necessary for exam registration.

Grading procedure

The grade of the module will be the grade of the exam.

Basis for

Research in the field of Biophysics
