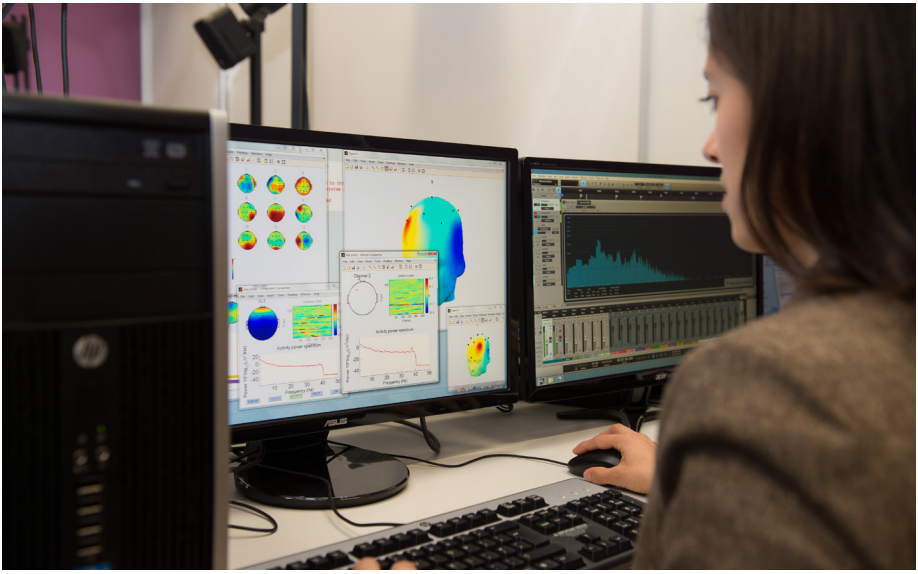
ingenieur
wissenschaften
htw saar

Neural Engineering

→ Master



→ Degree program at a glance

Degree	Master of Science
Program Duration	3 Semesters
Application Deadline	15th of January (for Summer Semester) 15th of July (for Winter Semester)
Tuition Fee	None
Accreditaion	ASIIN

→ Study structure

– **Summer semester**

Manufacture of Active Implants
Biomedical Signal & Image Processing
Functional Imaging in Neuroscience
Auditory Processing & Perception
Neural & Cognitive Systems
Elective Modules

– **Thesis semester**

Master's Thesis

– **Winter semester**

Technical Interfaces to the Nervous System
Neuro-inspired Artificial Intelligence
Neural Signal Analysis & Modeling
Clinical Neurophysiology
Elective Modules

→ Admission requirements

- Bachelor's degree or Diploma (UAS or University) in Biomedical Engineering, Electrical Engineering, Mechanical Engineering, Computer Science and Related Fields (210 ECTS). If you completed a 6 semester Bachelor's program (180 ECTS), you are required to pass selected modules from the htw's Biomedical Engineering Bachelor program with a total of 30 ECTS points
- Advanced level in English (B2 level)
- Detailed written application

Recommended prerequisites:
Applicants should have excellent grades and a sound background in engineering science. Basic knowledge of anatomy and physiology of the nervous system is recommended. Interest in research-oriented projects is presumed.
All our courses are taught as a block. Instruction language is English; Advanced level in English (B2 level) is required.
The semesters are not necessarily consecutive; students can apply for lateral entry.

→ Biomedical Engineering meets Neuroscience

Neural Engineering is an emerging interdisciplinary research area which merges neuroscience and engineering to understand, interface with and manipulate the nervous system. Applications range from brain-computer-interfaces and neuro-cognitive modelling to advanced electrode designs for implantable devices.

Occupational profile
The Neural Engineering course qualifies our graduates for demanding industrial R&D positions, e.g., in the development of nerve stimulators, diagnostic devices or active implants. Other emerging occupational fields encompass neuroergonomic (e.g., automotive branch) and neurocybernetic (collaborative robotics) applications, as well as the development of tailor-made applications in neuro-rehabilitation.

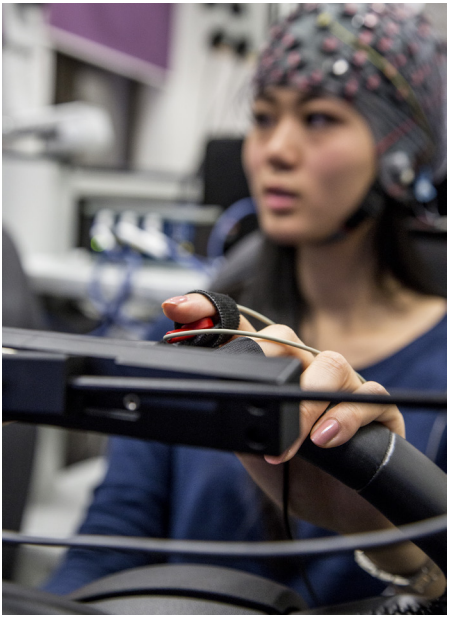
A considerable percentage of our Master's graduates seek to pursue an academic career path and start a doctorate program. Our national and international cooperation partners provide an excellent infrastructure for a doctorate.

Graduate students of the Neural Engineering program participate in international research projects.

This gives our students an early opportunity for active participation in the scientific community.
In these projects our students acquire essential scientific knowledge and social skills for future leadership positions.
The international orientation of the Neural Engineering program allows our students to establish international contacts in early career stages and gain confidence on the global stage.

→ Course Program

During the first two semesters, courses provide basic knowledge of neural and cognitive systems, auditory processing and perception as well as signal and image processing. Another block of lectures gives a theoretical and practical introduction to the manufacture of active implants an pro_ vides detailed knowledge of risk management and biocompatibility testing. Courses consolidate the students' proficiency in mathematical modelling of neural signals and their knowledge of clinical neurophysiology and functional imaging.

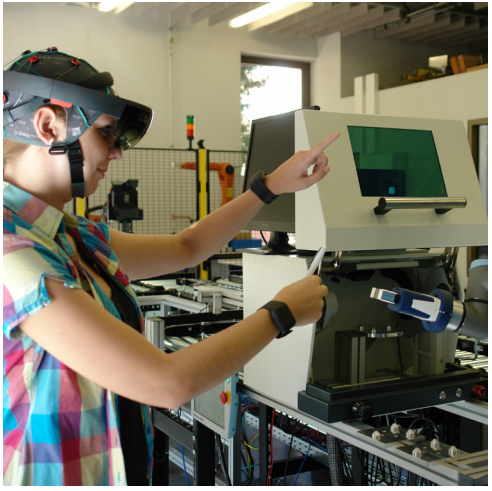


Obligatory courses are complemented by elective modules. All courses include a high percentage of hands-on work for consolidation and realization of imparted knowledge.

Student projects and theses can be carried out at our labs or with one of our external collaboration partners (e.g., Bosenberg-Clinics, Fraunhofer Institute for Biomedical Engineering, Saarland University Hospital). Moreover, students can apply for a practical internship with one of our collabora- tion partners abroad. In this way, students will reinforce their acquired skills and deal with real-world research or clinical problems.
In all cases, the supervising Professor and other academic staff will provide intensive guidance. Whenever possible, highly qualified guest lecturers will contribute to research and teaching: ne.htwsaar.de

The last semester is devoted to the Master's thesis that can be authored externally. The results of the Master's project will be presented in a seminar session. Publication of this work is encouraged, and past thesis work has frequently been published in scientific journals and/or at relevant international conferences.


Neuroergonomic Assessments in Driving Simulators




Neurotechnological Setups in Industry 4.0 and in Cars

Hochschule für Technik und Wirtschaft des Saarlandes
University of Applied Sciences

Fakultät für Ingenieuwissenschaften
School of Engineering

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Application
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Weitere Informationen: