

Master course «Electrical Engineering» MASTER OF SCIENCE (M. SC.)

Dear students, we welcome you warmly to our University on campus Künzelsau
(Heilbronn University, Reinhold-Würth-University)!



Photo W. Feucht (campus Künzelsau)

Electrical engineering is a key technology for many branches of the industry. Future electrical engineers are necessary for healthy economic development in different branches. Therefore, our regional-based industry needs experts in electromagnetic field theory, electrical machines, and electromagnetic systems.

„With a master’s degree you will be able to get an in-demand and high paying job as an electrical engineer, furthermore you will obtain unique knowledge and skills which are necessary for building a career in Germany and abroad“, said Prof. Dr.-Ing. Jürgen Ulm.

We offer a master’s degree in electrical engineering with a focus on electromagnetic systems. If you are interested in our master’s course, please contact Dr. Anna Konyev (anna.konyev@hs-heilbronn.de).

Course content:

Module S1 331310 «electromagnetic field theory» module responsible: Prof. Dr.-Ing. Jürgen Ulm:

Mathematical foundations, vector analysis, integral calculus, scalar and vector fields, Maxwell equations, electro- and magnetostatic, energy in electromagnetic fields, vector potential and forces, magnetic materials, non-stationary fields, time-depending fields.

S1.2 331312 Electro-magneto-mechanical converters (additionally to module 1). module responsible: Prof. Dr.-Ing. Jürgen Ulm:

Fundamentals of electromagnets, soft and hard magnetic materials, energy in magnetic circuits, electromagnet as a converter of stationary energy, electromagnet as a dynamic energy converter, control and design of electromagnets, excitation coil design and technology, coil design for highly dynamic applications, highly dynamic magnetic actuators, thermal analysis of electromagnet, design of electric drives, electromagnet design, optimization of electromagnetic actuators, non-destructive testing of materials, sensorless determination of the position and speed of the armature.

S3.1 331331 Magnetic materials (belongs to module S3) module responsible: Prof. Dr.-Ing. Jürgen Ulm:

Fundamentals of magnetic materials, electrical steel, steel losses, micromagnetism/magnetic domains, powder composites/sintered soft magnetic materials, soft magnetic ferrites, fast hardening soft magnetic materials, NiFe and CoFe crystalline soft magnetic alloys, selection of magnetic materials, magnetic materials for actuators, sensors, inductive components, material requirements, permanent magnets: hard ferrites and rare earth magnets.

S3.2 331332 Magnetic Measurement Technology (belongs to module S3). module responsible: Prof. Dr.-Ing. Jürgen Ulm:

Acquaintance with measuring instruments for magnetic induction and magnetomotive force. Instruments for measuring the inductance of windings and coils, their principle of operation. Calculation and measurement of parameters of electrical machines for further modeling.

S3.3 331333 Simulation of an electro-magnetic-mechanical converter (belongs to module S3). module responsible: Prof. Dr.-Ing. Jürgen Ulm:

Fundamentals of electromagnetic simulation, introduction to finite difference method (FDM) and finite element method (FEM) numerical simulation, influence of errors and limitations of numerical simulation, error detection and plausibility testing.



Photo W. Feucht (Prof. Dr.-Ing. Jürgen Ulm)

During the course, you will have the opportunity to:

- work in parallel with regional firms on a cooperative basis;
- carry out research and development work for industrial enterprises in the region.

Further perspectives:

- after successfully completing a master's program, graduates receive not only high qualifications, but also higher education focused on a wide range of possible applications both in Germany and abroad;
- Opportunity to get a managerial position in German companies or public institutions;
- Master's degree graduates have the opportunity to continue their further education in Germany as part of a postgraduate course.

«We will support you during your study, as well as after receiving a master's degree in search of a decent job “, said Prof. Dr.-Ing. Jürgen Ulm.



Photo W. Feucht (Institute for Digitization and Electrical Drives)

Requirements for candidates:

- higher education, at least a bachelor's degree in electronics or electrical engineering;
- Knowledge of German and English

Start date: winter semester.

Application deadline: until 15 of July 2022.

Submitting an application: You can find the necessary information on the website: www.hs-heilbronn.de/werbung

Central Student Advisory Service:

Tel: +49 7131 504-6693

E-Mail: zentralestudienberatung@hs-heilbronn.de

Contact:

Heilbronn University
Reinhold-Würth-University
Campus Künzelsau
Daimlerstraße 22 | 74653 Künzelsau
Tel.: +49 7940 1306-0
www.hs-heilbronn.de/tw