HTWG

**Hochschule Konstanz**
University of Applied Sciences

**Degree Program**
Sustainable Engineering
and Future Technologies
Bachelor of Engineering (B.Eng.)

www.htwg-konstanz.de/en/set

# Sustainable Engineering and Future Technologies (B.Eng.)

SET

Areas of Specialization:
- Energy Science and Technology
- Sustainable Mobility
- Environmental Engineering
- Data Based Engineering
- Robotics and Cyberphysical Systems

# Profile

| | |
|---|---|
| **Length of Studies** | 7 Semesters |
| **Language of Instruction** | English (integrated German language acquisition) |
| **Program Type:** | Full-time |
| **Start of Studies** | Winter Sem.<br>Summer Sem. |
| **Standard Class Size** | 40 |
| **Application Deadline** | November 1st for summer semester,<br>June 1st for winter semester |
| **Degree** | Bachelor of Engineering (B.Eng.) |
| **Departments** | Mechanical Engineering + Electrical Engineering and Information Technology |

It is possible to complete part of your studies abroad.

# Areas of Specialization

By your fifth semester in the program, you will be ready to choose your area of specialization. Do you want to develop technology for alternative energy or play a role in sustainable mobility? Are you more interested in environmentally friendly processes, big data, or robotics? You can choose from five fascinating areas of specialization:

### Energy Science and Technology

Students in this specialization focus on forward-looking, **sustainable energy generation and storage** as well as learning how to design powerful and **intelligent networks** for tomorrow's energy supply.

### Sustainable Mobility

Students that specialize in sustainable mobility design and develop **high-performance electric drives** as well as **intelligent and autonomous vehicles** with diverse sensor technology while also developing **alternative mobility concepts**.

### Environmental Engineering

This area of specialization focuses on resource-efficient methods and environmentally-friendly processes. Students in this area learn how to **obtain valuable secondary raw materials through recycling** and how modern technology can contribute to **industrial environmental protection.**

### Data Based Engineering

Students in the data-based engineering specialization learn to **optimize processes** and **develop autonomous systems.** They apply modern signal processing, artificial intelligence and machine learning techniques in order to help **guide manufacturing into a digital future.**

### Robotics and Cyberphysical Systems

In this area of specialization, students learn to use various sensor modalities, image processing and artificial intelligence to **develop autonomous and networked systems** – and work at the **interface between the virtual and physical world**.

# Sustainable Engineering and Future Technologies

**Optimally prepared for current and future challenges:** Applied artificial intelligence, the transition to renewable energy supply, sustainable mobility, and environmentally friendly processes have one thing in common: We can only overcome the major challenges of our time when experts from different fields work together.

The bachelor degree program Sustainable Engineering and Future Technologies provides you with interdisciplinary knowledge from the fields of mechanical engineering and electrical engineering. As a graduate, you will therefore be ideally prepared for the challenges that await us.

# Good reasons to study Sustainable Engineering and Future Technologies

**Contribute towards a sustainable future:** Are environmentally friendly and pioneering technologies important to you? We equip you with the toolkit you need to help make the future sustainable in your later professional life.

**Interdisciplinary technology studies with practical training:** During your studies, you will receive interdisciplinary and practical training in the fields of mechanical, electrical and process engineering. You typically complete the practical semester and thesis in the industry, where you can gain valuable practical experience.

**Fascinating areas of specialization:** During the main studies, you can choose from five fascinating areas of specialization: Energy Science and Technology, Sustainable Mobility, Environmental Engineering, Data Based Engineering, and Robotics and Cyberphysical Systems.

**International and intercultural:** Thanks to the lessons held in English as well as the international fellow studies, you can already benefit from intercultural experience during your studies. We therefore prepare you optimally for an international working environment.

**Strong support and advice:** Small semester sizes, (lab) exercises in small groups, and personal contact with the teaching staff ensure you receive strong support. Besides the friendly learning atmosphere, we also offer you numerous tutorials and a wide range of learning and advisory services at the Konstanz University of Applied Sciences.

**Study where others spend their vacation:** At the Konstanz University of Applied Sciences, you study at an excellent location: right on the banks of Lake Constance. The oldtown district, with its numerous bars, is only a five-minute walk away. In winter, beautiful ski resorts await you in the nearby Alps.

# Study Process

**Foundation studies**
The first two semesters of your studies are called the foundation studies. Here you will learn the **basics of mechanical engineering, electrical engineering,** and information technology that will provide you with the foundation for the rest of your studies.

**Main studies**
The third to seventh semester in the program is referred to as the main studies. This part of your studies involves more advanced coursework, a practical internship, as well as writing your bachelor's thesis.

During the third semester, you will take courses that **build on and expand the knowledge and skills** covered in during the basic studies.

The fourth semester involves completing an **internship at a company.** Here you will gain practical experience and learn about the structures and processes at this company. This experience will help you apply what you learned in the classroom, get a clearer idea of your future professional goals, and **establish contacts with potential employers.**

Starting in the fifth semester, you will begin to develop your area of specialization. Students in the program can **choose from one of the following specializations:** Energy Science and Technology, Sustainable Mobility, Environmental Engineering, Data Based Engineering, Robotics and Cyberphysical Systems

The final step in the program involves putting it all together by **writing your bachelor's thesis.** This can be done either at the HTWG Konstanz or at a company

**Main language of instruction for this degree program is English. Language courses as well as a few selected courses will be taught in German (see the table on the right for more information).**

**International students in the SET program are offered German language courses during their studies. This allows you to reach advanced (B2/C1) German skills by the end of your studies.**

# Professional Career and Prospects

Graduates from the SET program have a wide range of professional opportunities at their disposal. The interdisciplinary studies **prepare our students for careers** in research and development for sustainable and pioneering technologies, project engineering, data analysis and much more!

**Get your first job in Germany: SET graduates from countries outside the European Union can apply for an 18-month residency permit, which allows you to work in Germany.**

**Master's Programs**
Students who complete their bachelor's degree in the Sustainable Engineering and Future Technology program can also continue on to do a master's degree. Graduates can apply to **a wide range of master's programs** at the University of Applied Sciences Konstanz, including the Automotive Systems Engineering, Electrical Systems, Mechatronics, as well as Environmental and Process Engineering programs, or Industrial Engineering and Management and International Project Engineering which include an additional business focus.

# Organization of Studies

| Foundation Studies | | Main Studies | | | | |
|---|---|---|---|---|---|---|
| **1st Semester** | **2nd Semester** | **3rd Semester** | **4th Semester** | **5th Semester** | **6th Semester** | **7th Semester** |
| **5 ECTS** Language Basics **(DE)** | **5 ECTS** Communication and Intercultural Competences **(DE)** | **5 ECTS** Process and Material Technologies **(EN)** | **30 ECTS** **Integrated Practical Semester** | **5 ECTS** Control Systems **(DE)** | **5 ECTS** Project and Quality Management **(EN)** | **12 ECTS** **Bachelor's Thesis (EN/DE)** |
| **5 ECTS** Hands-On experience **(EN+DE)** | **5 ECTS** Physics **(EN)** | **5 ECTS** Machine Dynamics **(EN)** | | **5 ECTS** Software Engineering + Object Oriented Programming **(EN)** | **5 ECTS** Compulsary Elective Module **(DE/EN)** | |
| **5 ECTS** Machine Design and CAD **(EN)** | **5 ECTS** Technical Mechanics **(EN)** | **5 ECTS** Signals and Systems **(DE)** | | **5 ECTS** Sensors and Drives **(EN)** | **5 ECTS** Compulsary Elective Module **(DE/EN)** | **12 ECTS** Project **(EN/DE)** |
| **5 ECTS** Mathematics 1 **(EN)** | **5 ECTS** Mathematics 2 **(EN)** | **5 ECTS** Mathematics 3 **(EN)** | | **5 ECTS** Fluid Dynamics and Thermodynamics **(DE)** | | |
| **5 ECTS** Electrical Engineering **(EN)** | **5 ECTS** Programming **(EN+DE)** | **5 ECTS** Microprocessor Systems **(EN)** | | **25 ECTS** Specialization Modules: – **Energy Science and Technology** – **Sustainable Mobility** – **Environmental Engineering** – **Data Based Engineering** – **Robotics and Cyberphysical Systems** **(DE/EN)** | | **2 ECTS** Scientific Writing **(DE/EN)** |
| **5 ECTS** Basic Concepts of Sustainability **(EN)** | **5 ECTS** Electronics **(EN)** | **5 ECTS** Lab Project **(DE)** | | | | **4 ECTS** General Studies **(DE)** |

## Key

Mandatory Courses

Electives + Areas of Specialization

Internship Semester

Thesis

**ECTS** European Credit Transfer System

Lectures taught in: **EN** English | **DE** German | **EN+DE** English + German | **DE/EN** German or English

# Applications

You can either start your studies in the winter or summer semester.

**Application deadlines:**
**Winter semester – June 1st**
**Summer semester – November 1st**

**Admissions Requirements**
We welcome your application to the SET program at the HTWG Konstanz! In order to be admitted, you will need to submit one of the following qualifications: **University entrance qualification,** such as the general matriculation standard, the subject-related matriculation standard, advanced technical college certificate / Professional training certificate (e.g. **"master craftsperson", technician,** etc.) / **Vocational qualification** in conjunction with an aptitude test and a recognized standardized international qualification.

**International applicants** who do not have German university entrance qualifications must have **their diplomas recognized** by the Center for International Students (Studienkolleg) located on campus.

All applicants to the SET program must have **B2 level English skills** or higher. International applicants must also have **A1 German skills when they submit their applications** and A2 German skills when they start their studies.

But no stress: the University of Applied Sciences Konstanz offers a preparatory German course that takes place during the four weeks before the start of the semester.

# Contact

For questions about the program or to set up an academic advising session, please contact:

**Student Advising in the Department of Electrical Engineering and Information Technology**
Phone +49 7531 206-243
E-mail set-international@htwg-konstanz.de

**Prof. Dr. Boris Böck**
Department of Electrical Engineering and Information Technology
Phone +49 7531 206-244
E-mail boris.boeck@htwg-konstanz.de

**Prof. Dr. Christian Nied**
Department of Mechanical Engineering
Phone +49 7531 206-535
E-mail christian.nied@htwg-konstanz.de

For questions concerning your application, please contact:
**Student Administration Services**
set-administration@htwg-konstanz.de

For general questions about studying at the HTWG Konstanz, please contact:

**The Student Advising Center**
Phone +49 7531 206-777
E-mail zsb@htwg-konstanz.de
www.htwg-konstanz.de/zsb

For more information, please go to:
www.htwg-konstanz.de/en/set

# HTWG Konstanz – University of Applied Sciences

The HTWG Konstanz – University of Applied Sciences is located directly on the Rhine River in the Konstanz neighborhood known as »Paradise«. We offer a complete college infrastructure, including our award-winning library and cutting-edge labs on a compact, convenient campus, making this a wonderful place to study.

At the HTWG Konstanz, we offer small classes and practically-oriented research projects. We take an interdisciplinary approach, support innovation and place a high value on internationality: This can be seen in our partnerships and exchange programs with more than 70 colleges and universities around the world.

4,800 students currently pursue 20 different bachelor's and 15 master's degrees in the Architecture and Design, Civil Engineering, Electrical Engineering and Information Technology, Computer Science, Mechanical Engineering as well as Business, Cultural, and Legal Studies departments.

In addition to top-notch educational opportunities, Konstanz and the Lake Constance area offer students a wide variety of sports and leisure activities. Student dorms are located on campus, directly on the water and within walking distance from the attractive city center.

**HTWG Konstanz**
University of Applied Sciences

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