Universität Hannover

University of Hannover

Germany – Lower Saxony

Electrical Engineering and Information Technology

Diplom
Bachelor of Science
Master of Science

Studying at the University of Hannover

It all Began with 64 Students

The heart of the University of Hannover beats in the idyllically situated Welfencastle. The Secondary Vocational School, which was founded in 1831 and later named the Royal College of Technology, moved into the former royal palace in 1879. Since then, it has developed into a modern University. Starting with 64 students at the Secondary Vocational School, the number has now grown to about 27,000 students. Today there are 2000 scientists working in 16 different facultys with over 160 Institutes.

Whether you are developing Super-Chips, researching the effects of Multimedia on the family and workplace, or gaining new knowledge in biotechnology, you can choose your specific field of interest from a wide range of fields.

Studying at the University of Hannover

With more than 50 fields of study in engineering, the natural sciences, jurisprudence, as well as the humanities and social sciences, the University of Hannover offers a broad range of options from which those pursuing an education can choose. This great selection opens up numerous combination possibilities, by which you can create your own unique student profile. Many courses of study are offered by few other German universities, including horticulture, landscape architecture and environment development, biochemistry as well as teacher training for vocational school teachers.

Worldwide Cooperation

The international outreach of the University of Hannover is one of its many pluses. You can earn world-renowned degrees, for example the "Magister Legum Europae" in the faculty of law. The Foreign Language Center will prepare you in any foreign languages you may use in your career. The International Officesupports students by participating in the Mobility Program and by recognizing examination results of students who study abroad.

The University of Hannover offers all students free access to the Internet. Since the summer of 1999, the University has been equipped with a multimedia lecture hall. Today you have the opportunity in virtual classrooms to follow many lectures online, take part in class discussions, or post your own work.

Be Informed and You will Win

To seek an education is to plan for life. An early glimpse into the daily life of a student can prevent you from making a wrong decision. The University of Hannover can he lp you in the decision-making process: for questions regarding the admissions process, choosing a major, or continuing your education, the Central Advising Office (ZSB) has extensive information. Those interested in a specific major can declare a major and class through this office and can also get a behind-the-scenes glimpse of research and teaching. Under the motto, "Try Out An Education," there is a specially organized program which arranges tours of the institutes, group visits with students to lectures, and discussions with instructors.

University Education – Starting Out in a New Environment

Starting the first day of study, it is necessary to take initiatives and act responsibly. In order to smoothly manage the transition into the life of a student, the University of Hannover offers special introductory seminars. There are tutors – experienced upper classmen – who will help you with any organizational or major-specific questions. During your entire education, academic advisors are ready and waiting to offer advice and suggestions. Also, when you make the transition into the workforce, you will not be alone: University Career Services will help you by organizing job fairs right on campus. Numerous institutes of the University are always building upon existing networks, from which you can profit.

Profit From the City of Hannover

Students can profit from the city of Hannover as a city of expositions and fairs on many levels. There are numerous jobs at the fairs, but the cultural offerings of the city are also remarkable. Every year there are major open-air concerts. Jazz clubs, opera, theaters, and museums attract international attention. Admission for students to the city theater is reduced by 50 percent. As a festival and university city, Hannover also has a colorful bar and club scene.

The University Offers More Than Just Knowledge

As a student at the University of Hannover you can also choose from an extensive list of extra-curricular activities. The University Sports Center offers roughly 70 different sporting activities, from dancing and alpine skiing to rowing. Those interested in music can participate in the University Choir or Big Band. The Student Center provides for the body's well-being: the cafeteria is one of the best in all of Germany!

Advanced Degree Programs at the University of Hannover
- a Technical Oriented Selection

Applied Computing
Architecture
Biochemistry
Chemistry
Civil Engineering
Computational Engineering
Computer Science/Mathematics
Construction Technology
Electrical Engineering/Information Technology
Geoscience
German
Industrial Engineering
Mathematics
Mechanical Engineering
Meteorology
Physics (General and Technical)
Sport

Electrical Engineering and Information Technology

Electrical Engineering is omnipresent: it applies to a motor in a washing machine just as it does to a generator of a power station or a microchip of a computer. We take electrical engineering for granted when we turn on a television or program a video recorder. Electrical Engineering covers both electrical and electromagnetic phenomena. It includes power, automation, and communications engineering, just as it does microelectronics and information technology.

Skills and Abilities

Since we can only see the effects of electricity and magnetism and not the electricity and magnetism themselves, electrical engineers often work with images (field lines and patterns, control loops, circuit diagrams). This means that students wishing to study electrical engineering should have an adequate technical background, good visualization capabilities, the ability to think logically, and also an interest in mathematics. In order to put scientific knowledge into practice, students will also need to have a feeling for feasibility and costs of projects.

Teaching and Research in Hannover

There are 9 institutes within the Faculty of Electrical Engineering and Information Technology. The entire extent of electrical engineering, ranging from the classical disciplines to modern data processing, is represented. The spectrum stretches from electrical power supply, mechatronics (taught jointly with the Faculty of Mechanical Engineering), high voltage engineering, and power electronics to high frequency engineering, semiconductor technology, microelectronics, and information technology. The University of Hannover is the only German university to have a research emphasis in electrothermal process engineering.

Educational Matters

Earning a degree in electrical engineering at the University of Hannover provides a well-rounded, scientifically-grounded education, complemented by practical training. The fundamental courses will cover the basics of electrical engineering and its neighboring disciplines, as well as information technology, mathematics, and applied science. For a specialization within the major, students concentrate on one of the following areas: power engineering, automation technology, communications engineering, microelectronics or information technology.

Practical Training

Included in the education are basic and advanced practical training lasting a total of 26 weeks, of which at least eight weeks must be completed before the commencement of studies. During this time, students gain insights into manufacturing and operational processes and the organization of industrial corporations. Knowledge acquired through lectures and homework is deepened through practical laboratory work. As an undergraduate or graduate, students learn to apply their scientific knowledge. Even undergraduates have the opportunity to work as a temporary laboratory assistant on a research project, thereby gaining background knowledge of the major while receiving an income.

Job Profile and Occupation Characteristics

One important goal of the education is to prepare the student for scientifically-grounded, independent work in research, development, and production. In addition, graduates are qualified to enter technical sales and senior management positions.

The extensive training in theory fundamentals aims to enable engineers to keep up with the quick pace of technology while also taking socially- and ecologically-minded production methods into consideration.

International Degrees and Initiatives

The faculty offers students the opportunity to earn the internationally recognized Bachelor's and Master's Degree along with the traditional Diplom. While the Masters Degree and traditional Diplom are of the same merit, the Bachelor's Degree is completed after only six semesters. The basic curriculum is nearly identical for all students, whether studying for a Diplom or Bachelor's/Master's Degree, and an intermediate examination (Vordiplom) is given upon its completion.

Studying for a Master's Degree, which takes four semesters, builds upon the education received for the Bachelor's Degree. Students who have an internationally recognized Bachelor's degree can immediately begin studying for a Master's Degree. Credit hours, which are internationally recognized, are awarded upon completion of courses and achievements, thus simplifying transfers to and from universities around the world. Hannover itself helps students gain international experiences since in our faculty 15 percent of the fellow students come from other countries.

The institutes within the faculty have numerous exchange programs with foreign universities, including Stanford University (USA), the University of Bristol (UK), and Bordeux (France), Valencia (Spain), and Shanghai (China) Universities. This enables students to have meaningful international experiences while studying abroad.

Degree in Industrial Engineering

The Faculty of Electrical Engineering and Information Technology in cooperation with the Faculty of Mechanical Engineering and the Faculty of Business Administration and Economics opened up the study of industrial engineering in the winter semester of 2000/2001. This interdisciplinary model is a one-of-a-kind in Germany. Further information and details can be found in the corresponding information brochure.

Occupational Fields

Graduates of electrical engineering and information technology work in research and development laboratories in virtually all branches of industry, including power supply, software, or service industries, in public service, such as the Technical Inspection Agency, and in research and educational institutions. They w ork in the areas of power, communications, computer, automation, and transportation engineering, in mechanical engineering, and in medicine. Engineers new to industry often begin in the area of development where after only a short time they are entrusted w ith managing small projects. As their scope of responsibilities increase, not only technical but also management skills are needed.

Career Outlook

From Germany's economic standpoint, it is essential to maintain the country's lead in technology. This requires continuous innovation, which in turn demands the need for many-faceted, qualified engineers who are confident in using scientific methods. With an university degree you will have the best preparation.
Modern areas of interest in industry, such as internet service, mobile communications, and alternative energies, require substantial investments. In these fields there will be numerous open work positions. Recent studies show that Germany has an annual demand of 3000 to 4000 new engineers. Based on the number of students presently beginning an university education, only about 1500 graduates will be available. The job outlook for beginning students is therefore outstanding.

Important Dates

Application deadlines for Germans, foreigners with a diploma issued by a school in Germany, and citizens of EU countries:

- 30.09. (non-restricted degree programs) for the following winter semester
- 31.03. (non-restricted degree programs) for the following winter semester

Application deadlines for citizens of non-EU countries

- 30.11. for the following summer semester
- 31.05. for the following winter semester

Courses start, lectures begin:

- 14.10. for the 2002 winter semester
- 07.04. for the 2003 summer semester

Student Orientation Events

- University Information Day
- A Taste of University Life

Spotlights

Electrical Engineering and Information Technology

Help While Starting Out

Students transitioning into their new phase of life at the University of Hannover will find plenty of orientation and decision-making aids to help them choose between the abundance of options.

Introductory seminars are held right at the beginning of the semester to give students detailed information regarding the different facultys and curriculums at the University. As an educational preparation, there is a mathematics-preparatory course available the week prior to the start of the winter semester to help refresh their math and study skills. Also, a voluntary tutoring program is offered by upperclassmen. Each tutor takes between 15 and 20 first semester students “under their wings” to help them through the start of the semester. Furthermore, alongside every student there is a professor and graduate student to act as their personal academic advisor, with whom they can discuss any questions regarding the structure and organization of their course of study. Of course, there is also an academic advisor in the faculty. Many students organize study groups to prepare for exams together. The faculty provides specific rooms for this purpose, many of which are equipped with public computers. Students of various semesters meet to not only learn and exchange experiences, but to also organize leisure activities.

Study Electrical Engineering As a Woman?

“No problem!” says Kathi Fleischer, who earned her electrical engineering Diplom Degree from the University of Hannover in 1997. “Even if you are not one of those people who has been taking apart televisions since childhood, the field is fun. Naturally you need some stamina,” adds the engineer. “In Hannover I armed myself with good theoretical expertise in the field of communications engineering, which I put into practice in Bordeaux for my Diplom dissertation. Now in Munich, I work at Siemens developing chips for mobile communications applications.”

Attention Females: The winter semester of 2001/2002 saw some 1000 students enrolled in electrical engineering and information

technology, of which 8.5% were female. This is an increase from the first semester, for which 7% were female.

Internship in Silicon Valley

Andreas Lemke (tenth semester) emphasizes the significance of an internship abroad, “It was at a very early stage that I decided to incorporate an experience in the USA into my education. When there was an offer during a lecture to intern in the USA, I worked myself into the project by writing a research paper. Although I was only an intern, I worked with engineers as an equal member of the team in the area of development: progress reports, group discussions, training courses, and also corporate parties gave me good insights into the typical work environment in Silicon Valley. In addition, there were interesting discussions, contacts, and of course, friendships rounded off the whole experience.”

Innovative Power Engineering – A Challenge for the Engineers of the Future

Intelligent power systems will revolutionize the field of power engineering in the coming decades, in terms of the generation, allocation, and application of power. As Professor Bernard Nacke, director of the Institute of Electrothermal Processes, explains, “Decentralized power supply concepts, new unconventional methods of energy production, transmission, and storage, as well as energy management systems for energy applications will require intelligent solutions to control power flow. Applications will require the computer-aided development of adaptively-controlled fast drives equipped with appropriate power electronic control circuits as well as innovative production processes for new materials of the highest quality. Moreover, modern information and systems technologists will also be able to depict the core modules required for solving these tasks. The Institute of Power Supply and High Voltage Engineering, the Institute of Drive Systems and Power Electronics, and Germany’s only Institute of Electrothermal Processes have as their core research activity set themselves the goal of jointly developing solutions for future tasks and challenges.” Professor Nacke emphasizes that the very close contact the three power engineering institutes maintain with industry serves to guarantee that knowledge is continuously transferred from practice to the University. This in turn means that students can benefit from learning of the latest developments in the field of power engineering in their lectures and practical courses, thereby ensuring that they will be well-equipped to face the challenges in their future careers.

Study Guide

Electrical Engineering and Information Technology

Degrees

An university education can conclude with a Bachelor of Science Degree (B.Sc.), Master of Science Degree (M.Sc.), or a traditional Diplom (Dipl.–Ing). Students holding a Master of Science Degree or a Diplom can thereafter continue to study for a Doctorate (Dr.-Ing). The University of Hannover also offers teacher training for positions at vocational schools in electrical engineering.

Admission

Students can only commence their studies in the winter semester. At present there are no restrictions on admission. Applications should be mailed to the following address:

Universität Hannover
Immatrikulationsamt (I-Amt)
Postfach 6009
30060 Hannover
Germany

Or to:

Universität Hannover
International Office – Admissions
Welfengarten 1
30167 Hannover
Germany

The application documents can be obtained in written form from the Admissions Office, the International Office – Admissions, the CampusCenter, as well as the Central Advising Services Office. Application forms and admissions information are also available through the internet at www.uni-hannover.de.

Practical Training

An integral part of the education is the 26-week internship at an industrial firm. At least eight weeks should be completed before the commencement of studies. Details of the arrangement and recognition of practical training are regulated by the faculty. You may address all concerns and seek advice regarding the internship by telephone or fax from the Internship Office, which is responsible for both the Faculty of Electrical Engineering and Information Technology and the Faculty of Mechanical Engineering.

Length of Study

The standard length of study including all examinations and the production of a diplom dissertation averages to ten semesters, although students do not always manage to complete their studies within this amount of time. We provide numerous forms of assistance to help our students finish on time.
The maximum period for which BaföG educational assistance is awarded is ten semesters.

Beginning a Degree Program

The faculty offers entering students the opportunity to attend a five-day mathematics course in the week prior to the start of the winter semester to help refresh their math and study skills.During the first week of classes for the winter semester, there are various introductory and informational seminars. Details on these are provided in the registration forms.

In addition, during the first semester the faculty offers support through tutors (upperclassmen), who offer students advice and guidance on the curriculum and matters relating to the major.

Structure of the Education

The curriculum for the Diplom in electrical engineering and information technology is divided into two stages: the basic curriculum (four semesters) and the core curriculum (six semesters). The international Bachelor of Science Degree can be earned in six semesters. Continuing for four more semesters thereafter will also earn you the Master of Science Degree.

<table>
<tr><td>Diplom core curriculum</td><td>Master of Science core curriculum</td></tr>
<tr><td rowspan="3">6 semesters
(52 SWS)</td><td>4 semesters
(30 SWS)</td></tr>
<tr><td>Bachelor of Science core curriculum</td></tr>
<tr><td>2 semesters
(23 SWS)</td></tr>
<tr><td colspan="2">Diplom and Bachelor of Science basic curriculum</td></tr>
<tr><td colspan="2">4 semesters
(78 SWS)</td></tr>
</table>

SWS = weekly contact hours per semester

The basic courses cover mathematics, physics, fundamentals of electrical engineering, signals and systems, and fundamentals of computer science. Mathematics plays a particularly important role in electrical engineering since the fundamentals of electromagnetics and statistics are tightly imbedded in mathematical theory. Mechanics, material science, and thermodynamics are also important subjects. Aside from these, introductory lectures covering the basics of various specializations are offered.

Fields of Study and Specializations

The following fields of study and specializations are offered to students studying for a Diplom or Bachelor's/Master's Degree:

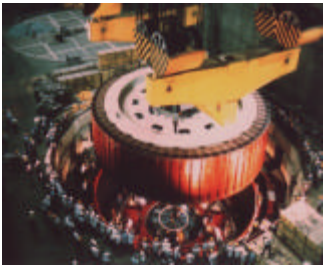
Automation Engineering
with specializations in:

- Mechatronics
- Instrumentation and Feedback Controls Systems

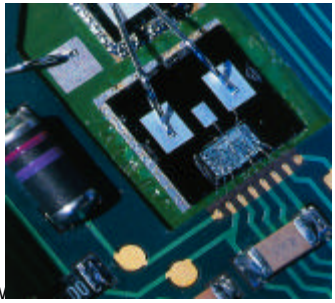
Automation Engineering involves the development of methods and components which help people operate plants, vehicles, and robots safely and economically.

Power Engineering
with specializations in:

- Electrical Power Supply
- Electrical Energy Conversion



Power Engineering encompasses the generation, transmission, and distribution of electrical power as well as its conversion into other forms of energy.



Microelectronics
ith specializations in:

Circuit and System Design
- Technology and Devices

Microelectronics is the basis of modern electrical devices and systems and their applications. It includes process technologies and devices as well as the corresponding circuitry, design tools, and testing equipment required for the production of integrated circuits.

Final Diplom Examination

The final Diplom exam generally consists of 14 subject exams (8 required courses and 6 electives in the chosen specialization) as well as the student research project and Diplom dissertation (each to be completed within six months).

The curriculum and exam for the Diplom are governed by the Diplom examination rules and regulations (DPO), as well as the faculties curriculum rules and regulations (which can be obtained from the faculty secretary, from the Central Advising Office – ZSB or from the web-pages of the faculty).
After completion of the basic curriculum, students can as an alternative to earning a Diplom opt to take the internationally-oriented two-phase curriculum leading to a Bachelor's and then a Master's Degree. In this case, students take the Bachelor's / Master's exams.

Bachelor's Examination

The Bachelor's exam generally consists of subject tests on the course lectures (covering 100 SWS) plus a Bachelor's dissertation (to be completed within a maximum of 6 months). It includes the subject tests from the intermediate Diplom exam.

Master's Examination

The Master's exam generally consists of subject tests on course lectures (covering 30 SWS) plus a Master's dissertation (to be completed within a maximum of 6 months).
All exams are given after the conclusion of each semester.

Doctorate

Many electrical engineering graduates continue their education after earning the Diplom or Master degree in order to receive a Doctorate (Dr.-Ing). This generally involves spending several years at one particular institute.

Recommended Reading

The monthly magazines "UNI" and "abi" are published by the Federal Employment Agency (Bundesanstalt für Arbeit) and regularly contain articles on education and career fields in all of the electrical engineering disciplines. It is always worthwhile to read through the latest two volumes. The magazines are available in the Central Advising Office (ZSB Infothek). You may also find informations at the web-pages of the university: www.uni-hannover.de or more specialized at: www.et.uni-hannover.de.

Should you have further questions, please contact the secretary of the faculty, the Central Advising Office (e.g. for questions regarding change of major, the admission process, etc.), or the academic adviser of the faculty.

The student representatives are the voice of the students. They give tours for first-year students and offer tips for studying, preparing for exams, and completing the practical training. You can find informations at: www.fet.uni-hannover.de

Many students work together in groups. There are specified rooms provided for the purpose of encouraging learning and socializing.

Rules and Regulations

A list of all rules and regulations pertaining to the curriculum and examinations can be obtained from the faculty, Central Advising Office (ZSB), or the website of the faculty.

Important Addresses for the Information and Advice

Admissions Office
Welfengarten1, Main building, room F 328
30617 Hannover
Hours:
Mon-Thurs 10:00-12:00
Thurs 2:00-4:00
i-amt@uni-hannover.de
www.uni-hannover.de/i-amt

International Office

- Admissions
  Welfengarten 1, 30167 Hannover
  (Main building, 1st floor, room F 307)
  Hours:
  Mon, Tues,Wed 10:00-12:00
  Thurs 2:00-4:00
  Tel.: 0511/762-2578; Fax:-19126
  Admissions@uni-hannover.de

- Studying abroad (incoming/outgoing students)
  Wilhelm-Grunwald-Haus
  Welfengarten 1A, 30167 Hannover
  Hours:
  Mon-Fri 9:00-12:00
  Thurs 2:00-4:00
  Tel.: 0511/762-2548; Fax –4090
  Internationaloffice@uni-hannover.de

CampusCenter
Welfengarten1, Main building, basic floor
30167 Hannover
Tel.: 0511/762-19381; Fax: -19385
Campuscenter@uni-hannover.de
www.campuscenter.uni-hannover.de

Dean of the faculty
Prof. Dr.–Ing. Bernhardt Nacke
Appelstrasse 11, 30167 Hannover
Tel.: 0511/762-19644; Fax: -19646
dekan@et.uni-hannover.de

Dean of studies
Prof. Dr.-Ing. H. Garbe
Institute of the Basics of Electrical Engineering and Measurement Science
Appelstr. 9A, 12th floor, room 1225
30167 Hannover
Tel.: 0511/762-3760; Fax: -3917
garbe@geml.uni-hannover.de

Secretary for the Faculty of Electrical Engineering and Information Technology
Appelstrasse 11, ground floor
30167 Hannover
Hours: Mon-Thurs 9:00-12:00
Tel.: 0511/762-19645; Fax:-19646
dekanat@et.uni-hannover.de
www.et.uni-hannover.de

Faculty Academic Advisor
Dr.-Ing E. Baake
Institute of Electrothermal Processes
Wilhelm-Busch-Strasse 4, 30167 Hannover
Available by appointment
Tel.: 0511/762-3248
baake@ewh.uni-hannover.de

Institutes
Appelstrasse 9A, 30167 Hannover:
- Institute of the Basics of Electrical Engineering and MeasurementScience
- Centre for the Didactics of Engineering
- Institute of Electromagnetic Theory and Radiofrequency and Microwave Engineering
- Institute of Communications Engineering
- Institute of Communication Theory and Signal Processing
- Institute of Electric Power Systems, Electric Power Engineering Section)

Wilhelm-Busch-Strasse 4, 30167 Hannover:
- Institute of Electrothermal Processes

Appelstrasse 11, 30167 Hannover:
- Institute of Automatic Control
- Mechatronics Centre

Appelstrasse 11A, 30167 Hannover:
- Institute of Semiconductor Elements and Materials

Welfengarten 1, 30167 Hannover:
- Institute of Drive Systems and Power Electronics

Callinstrasse 25, 30167 Hannover:
- Institute of Electric Power Systems (High Voltage Engineering Section (Schering-Institute))

Academic Examination Office
Welfengarten 1, 30167 Hannover
Hours: Mon-Thurs 10:00-12:00
Thurs 2:00-4:00 and by appointment
Tel.: 0511/762-2414, Frau K. Gries
k.gries@verwaltung.uni-hannover.de

The Academic Examination Office is located in the main building, Welfengarten 1, 1st floor. There you may also find notice boards.

Chairman of the Examination Board
Prof. Dr.-Ing. W. Mathis
Institute of Electromagnetic Theory and Radiofrequency and Microwave Engineering, Electromagnetic Theory Section
Appelstr. 9A, 16th floor, 30167 Hannover
Tel.: 0511/762-3201,Fax: -3204
mathis@tet.uni-hannover.de

Faculty Examination Advisor
Dr.-Ing Werner Dierker
Institute of the Basics of Electrical Engineering and Measurement Science
Appelstr. 9A, 12th Floor, Room 1223
30167 Hannover
Hours:
Mon 10:00-11:00
Tues 10:00-11:00
Tel.: 0511/762-3769; Fax: -3917
dierker@geml.uni-hannover.de

Library
University Library/ Technical Library
Welfengarten 1B, 30167 Hannover
Hours:
Mon-Fri 9:00-7:30
Sat 9:00-2:00
Tel.:0511/762-2268 (Information Desk)
www.tib.uni-hannover.de

University of Hannover- Campus Area

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