TU Clausthal

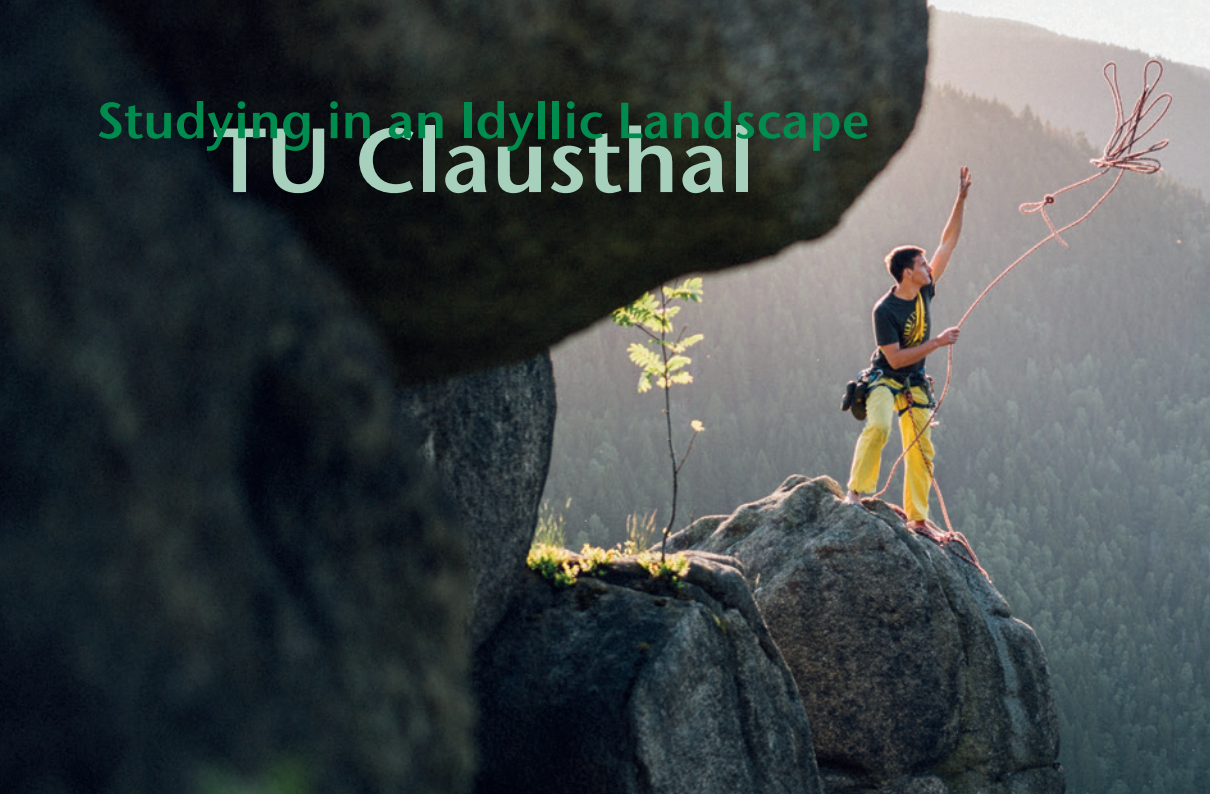
Clausthal University of Technology

Studying at TU Clausthal

Studying at TU Clausthal

Studying in an Idyllic Landscape

TU Clausthal



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»Make no small plans here. What I gained from here is not just technical knowledge, but an overall development of skills for an individual to impact the world. Your future is waiting.«

Arun Thomas, India
Mechanical Engineering (Master)

Welcome

Beginning to study at a university can be an exciting, yet overwhelming period in one's life. Deciding on a university, not to mention a major, can be frustrating if one has too little guidance. We, at Clausthal University of Technology (TU Clausthal), understand the challenging experience of choosing a university and degree program and would like to make this choice as easy as possible for you. Therefore, we have put together a comprehensive study guide, so you can make the right decision for you and your future.

Clausthal is a small mountain town widely known as a center of education and research. Our university offers you an extensive range of scientific and engineering degree programs, as well as multiple possibilities to participate in numerous research projects. Thus, you will benefit from the advantages of an open, friendly and safe community while profiting from the highest standards of education. On behalf of the entire TU Clausthal, I welcome and encourage you to discover more about our academic environment with this guide.

Prof. Dr. Thomas Hanschke
President of TU Clausthal

Clausthal University of Technology
Combining Tradition and Innovation

Clausthal University of Technology is an internationally renowned institution with a long, outstanding history in ingenuity and determination. Founded in 1775 as a royal college for the mining industry, the University has greatly expanded its educational programs within the last decades to include a variety of degree programs. Beginning in the early 60s, degrees in scientific fields of study, such as mathematics, physics and chemistry, were introduced and the University renamed itself as the University of Technology. In the 90s, the TU Clausthal developed even further by offering new degrees in business administration, environmental and energy and raw materials engineering. This initiative stemmed from the rise of globalization, the steadily increasing population growth and the subsequent high demand for sustainable resources. Interdisciplinary research has always been a key component of various degree programs in an effort to preserve the environment and manage our finite fossil fuels and resources efficiently for future generations. Currently, research and education are focusing on the fields of renewable energy, energy and raw materials, natural and materials sciences, economics, computer science, mechanical engineering and process engineering. Students from all around the globe find the education here in Clausthal a unique, rewarding experience.

Professors and students work and research closely together, thus creating a more individually-based learning atmosphere and providing our students with the appropriate skills to enter the job market as professional and valuable assets in their respective fields. Furthermore, by combining the engineering and scientific expertise of Lower Saxony, we are on a par with the best research universities worldwide. Additionally, in three centers, the Energy Research Center Niedersachsen (EFZN), the Clausthal Center of Materials Engineering (CZM) and the Center of Simulation (SWZ), we aim to combine applied research in natural sciences, engineering and economics. Throughout the University's history, we have consistently maintained a strong tradition in engineering and natural sciences, thereby bridging the gap between tradition and innovation.


Clausthal-
Zellerfeld

Location
A Home Away from Home

Clausthal-Zellerfeld is a small university town with a population of 15,000, located in the center of Germany, in Lower Saxony. The town is nestled in the scenic Harz Mountain National Park at an approximate altitude of 600 meters (2,000 feet) above sea level. It is a safe, friendly town that welcomes visitors from every corner of the world. Our location allows students to reap the benefits of both the rural and urban experience. In an intellectually stimulating environment, students can always find a quiet place to study for their classes within the tranquility of the green surroundings. Equally attractive is the abundance of nature which provides ample opportunities for students to remain physically fit throughout the entire year. Students seeking a change of pace can travel quickly and easily to a larger city, using the extensive public transportation system. We are only 100 km away from Lower Saxony's state capital, Hannover, 240 km from Hamburg, 290 km from Berlin, and 300 km from Frankfurt. We understand that moving to a new town can be an overwhelming experience; therefore, the TU Clausthal, in association with town officials, works diligently to ensure that new students become acclimated to their new surroundings as comfortably and smoothly as possible. With so much support, it is next to impossible to feel alone here.

Historic Environment
UNESCO World Heritage

Beautiful green forests, clear pristine waters, and healing fresh air all describe the beauty of the Harz Mountains, which attract thousands of visitors seeking relaxation. The Harz was once one of the leading mining regions in Europe. Today it is marked not only by its rich landscapes, but also by its “monument density”, unrivalled in Europe.

Churches, monasteries and 1,800 timbered buildings convinced UNESCO to award the title of World Heritage Site to the enchanting old city center of Goslar for its unique beauty.

The ore mine Rammelsberg is the only mine in the world which had been in constant use for over 1,000 years until it ceased operation in 1988. Since then, it has become one of the biggest and most innovative museums in Germany.

The Upper Harz Water Management System in Clausthal-Zellerfeld is one of the largest and most important historic mining water management systems in the world. It is a system of dams, reservoirs, ditches and other structures developed for the generation of water power.

Study Conditions Excellent

At Clausthal University of Technology, students receive an education which is fully accredited and recognized worldwide, and the reputation of TU Clausthal is regularly reflected in taking a leading position in university rankings. With exceptional study conditions, TU Clausthal rises above the majority of German universities. Due to the fact that the university is small in size, students and teaching staff have been able to develop a very good personal rapport: these are the best conditions for success in one's studies. Our remarkable faculty-to-student ratio of 1:9 is very beneficial to the 5,000 students currently enrolled here. The lecture halls as well as individual classrooms are equipped with state-of-the-art multimedia to enhance their educational experience. One of the TU Clausthal's key projects is documenting lectures, seminars, and special events so that they are made readily accessible online to all students. This allows students to review their lessons at their own pace in a comfortable study environment. Students additionally profit greatly from the high-tech laboratory equipment found in the different departments. This ensures that our students receive a hands-on approach during their studies in addition to their theoretical education. Traveling to and from classes is also easy, since the distances between the individual institutes are short.

International Profile
Worldwide Connections

Internationality has always been very important at TU Clausthal. We are presently working in cooperation with approximately 150 universities and research facilities worldwide. Many of these universities have had a long standing partnership with TU Clausthal for several decades.

Students at Clausthal University of Technology enjoy a unique and culturally-rich atmosphere. More than 30 % of the students and 20 % of the academic staff come from abroad, making the campus very international. Therefore, students – German and international alike – have numerous opportunities not only to learn foreign languages and practice speaking and writing them with native speakers, but also to broaden their horizons by discovering more about different cultures from the international students in Clausthal.

The majority of the degree programs are currently taught in German. Some of the lectures, however, are already being taught in English. At the moment, four Master's degree programs are conducted in English.

Internationales Zentrum Clausthal (IZC)
International Center Clausthal (IZC)

In cooperation with the University's administration and institutes, the International Center Clausthal (IZC) coordinates the international relations and activities of TU Clausthal. The IZC is the central service point for international and German students as well as for University staff and faculty. Services provided by the IZC include:

- Guidance on practical matters regarding studying and living in Clausthal
- German language classes
- Foreign language classes
- Intercultural trainings
- Excursions, field trips and other events
- Student support from Study Buddies

and much more.

Further information is provided on our website: www.izc.tu-clausthal.de

German Language Courses

Whether you are just beginning to learn German or you would like to improve your current German language skills, TU Clausthal is the right place. The Language Center at the International Center Clausthal (IZC) offers a large variety of intensive German language classes to help international students prepare for their studies and the German language examinations for university admission (DSH and TestDaF). Furthermore, a broad range of German language courses at all levels and on a variety of topics are provided for all international students during the semester. In all our courses, we attach great importance to a communicative language style of teaching. The team of the Language Center will gladly provide students with any additional information they might need regarding our German language courses and our extensive language program.

Cost of Living
Affordable

Living costs in Clausthal-Zellerfeld are lower than in many other Germany cities, and there are many accommodation possibilities in Clausthal. Students may apply to live in one of the student residence halls or look for a private single or shared apartment. Most rooms in our halls of residence are furnished, but bedding, kitchen and cleaning supplies are not provided. Private apartments are typically unfurnished. Naturally, expenses heavily depend upon individual lifestyles, but an approximation of the costs which students should expect to incur monthly for living expenses has been provided below.

Estimated cost of living/month:

Housing	300 Euro
Food	200 Euro
Health insurance	80 Euro
Other, e.g. books, phone	70 Euro
Total	**650 Euro**

Sports
Keeping active during studies

TU Clausthal students and faculty can find a wide variety of courses at the Sports Institute. In fact, there are more than 60 different types of outdoor and indoor activities suitable for every athletic level. TU Clausthal's remarkable sports program inspires people from all walks of life to try something new or to improve their current athletic abilities. During any season, the landscape offers a beautiful, natural background for various outdoor activities, from cross-country skiing to mountain biking to walking. Indoor courses include, among others, volleyball, aerobics and strength training. Competitive sports are also very popular and many athletic events take place in the Harz Mountains. The Sports Institute offers courses, such as swimming and triathlon training, in this area as well. The broad selection ensures that there is something for everyone here in Clausthal.

Complete List of Programs

TU Clausthal

Bachelor's (German)

Master's (German)

Master's (English)

Degree Structure

Bachelor's Degree

A Bachelor's degree is an internationally recognized undergraduate degree. Bachelor's programs usually last six semesters. In the first year, the student acquires fundamental knowledge within the specific field of study and becomes acquainted with academic and scientific working methods. In the second and third years, the student has the opportunity to specialize in certain areas. The programs are completed with a final project or thesis.

Master's Degree

A Master's degree is an internationally recognized graduate degree. Master's programs usually last four semesters. They are designed for students who have successfully completed their Bachelor's degree and wish to specialize and broaden their knowledge in their field of study. Alternatively, it can also serve as a conversion course from the Bachelor's degree subject, giving the students the opportunity to add an additional set of skills and knowledge to their qualification at bachelor's level. Master's programs are completed with a final project or a thesis.

Doctorate

A doctorate is possible in all fields of studies offered at the TU Clausthal. There are currently no special courses for doctoral students. A doctorate at the TU Clausthal means completing an individual research project under the guidance of a professor. Doctoral students need to find a professor who is interested in their chosen research field and who will supervise their doctoral work. The time required to complete a doctoral degree depends on the field of research and the successful progress of the research work, and ranges generally from three to four years.

»Clausthal is home to one of the best universities in Germany. Here I have everything an international student needs, especially the support of the professors and the friendliness of the entire study body.«

Brulinda Imeraj, Albania
Business Administration (Bachelor's)

»The TU Clausthal, known for its advances in engineering education and research, has many partnerships with automotive companies. TUC gives me great connections, so I can work in this industry in the future.«

Margaux de Bar de la Garde, France
Mechanical Engineering (Bachelor's)

Business Administration (B.Sc.)

The administration of businesses means managing people and resources in an efficient way in order to achieve the general objectives and goals of the organization. This involves the preparation, development, and implementation of rational decisions and the management of business operations. This program is designed to provide students with the basic tools to either meet the challenges accompanied with these tasks in today's globalized business environment, or to broaden and deepen their knowledge in an economics Master's degree program, such as the Master of Science degree in Technical Management offered by Clausthal University of Technology.

Curriculum

Topics in this program are general management, economics, accounting, finance, operations management, marketing, human resource management, decision analysis, law, computer sciences, mathematics, and statistics. The program also includes a seminar, a simulation game, electives, and preparation for writing a thesis paper. Key skills, good English skills, and a mandatory internship help to prepare the students for the duties and responsibilities of the current job market.

Academic Advisor

Prof. Dr. Heike Schenk-Mathes
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Language of instruction: German

Business and Engineering (B.Sc.)

Students in the Business and Engineering degree program are trained to deal with a large variety of tasks at the intersection of management and engineering. Graduates help companies master the complexity of technical businesses and work on business projects that are subject to technical constraints. The program's objective consists of qualifying students to engage in strong analytical and contextual thinking and to bridge the borders between engineering and management.

Curriculum

The main emphasis of the program is on disciplinary fundamentals and general competencies serving to develop a problem-oriented and cross-functional working attitude. The subjects discussed range from elements of business administration, optimization, economics, law, and computer science to mechanical, electrical and production engineering, material sciences, and energy systems. A seminar, electives, and the Bachelor's thesis allow for the individual tailoring of the degree.

Academic Advisor

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Language of instruction: German

Business Information Systems (B.Sc.)

This program is a 3-year full-time degree that offers students a broad university-level education in the fundamentals of computer science, economics, and the application of computer science methods and tools in designing and operating advanced business application systems such as Enterprise Resource Planning systems or Product Data Management systems. Our students experience a mixture of lectures, tutorials, seminars, lab classes, and internships. In the first year, they attend introductory courses like Business Process Modeling, Programming, Business Information Technology, and Introductory Math. Our weekly Beginners' Workshop provides hands-on experience with small team-based projects and case studies, and discusses future career options for graduates. In the second year, students will learn about core areas like software engineering, databases, human-computer interaction, production processes, and accounting. In the final year, our students deepen their skills and study selected topics from a range of electives such as integrated application systems, operations research, micro-economics, and intelligent traffic and transport. Students develop their competencies in a capstone project, and write a Bachelor's thesis under the guidance of a professor. Our graduates have excellent job opportunities in IT, consulting, and business administration in industry and service sectors alike.

Academic Advisor

Prof. Dr. Jörg Müller
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Language of instruction: German

Chemistry (B.Sc.)

This program introduces students to the basic principles of chemistry and teaches them methods for solving chemical and scientific questions. In addition to comprehending modern chemical theory, it is important to acquire practical skills in preparatory and analytical chemistry and to gain an overview of important technical processes. In their Bachelor's thesis, students will conduct research work in one specific field to deepen their knowledge. This program qualifies students for the Chemistry Master's degree program, or enables them to enter their professional careers early, into a wide variety of chemical- and business-related fields.

Curriculum

- Mathematical and physical fundamentals
- Fundamental inorganic and analytical, organic and physical chemistry
- In-depth study in chemistry, including technical chemistry

Interdisciplinary courses and additional chemistry related subjects

- Fundamentals of biochemistry and macromolecular chemistry
- Fundamentals in glass, ceramics or building materials
- Toxicology and legal studies
- Excursion to a chemical company
- Computer science, business administration, or soft skills

Bachelor's thesis

- 3 months

Academic Advisor

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Language of instruction: German

Computer Science (B.Sc.)

This program offers students a broad university-level education in computer science.
Our graduates have excellent job opportunities in industry and administration.
Computer science is an enthralling subject and indispensable for the invention of novel technologies that help to advance society.
Our students experience a mixture of lectures, tutorials, seminars, lab classes, and practical courses. In the first year, they attend introductory courses, like algorithms and data structures, programming, computer organization, and introductory math. Our weekly informatics workshop provides hands-on experience with small team-based projects and discusses future career options for computer scientists.
In the second year, students will learn about core areas like software engineering, databases, human-computer interaction, distributed systems and networks, logic and verification, and embedded systems.
In the final year, our students deepen their skills and study selected topics from a range of electives, such as virtual reality, computer graphics, business informatics, application development, electronics, or operations research.
Our students demonstrate their competencies in a capstone project, and write a Bachelor's thesis under the supervision of a professor.

Academic Advisor

Prof. Dr. Sven Hartmann
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Language of instruction: German

Economic Geology (B.Sc.)

This program combines the expertise of the departments of mineralogy and geochemistry, economic geology, sedimentology, and hydrogeology. This degree program comprises a broad spectrum of mineral and energy resources and builds on a theoretical and practical base education in natural sciences. It also includes key branches of mining and recycling as well as water and oil/gas resources.

Curriculum

The first year comprises general courses on the basics of mathematics, physics, inorganic chemistry, and elementary geosciences. The second and third year focus on the geology, mineralogy, exploration, and mining of natural resources. About one third of the lectures deal with practical lab courses in mineralogy, petrology, and tectonics, complemented by field work. Students have to choose from among a set of courses which cover more specialized geoscience disciplines. The Bachelor's degree program ends with a thesis, for which three months are reserved.

Academic Advisor

Prof. Dr. Kurt Mengel
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Language of instruction: German

»After graduation from high school, I wanted to study abroad and decided to attend German language courses in Clausthal. I was so at ease here that I remained in Clausthal instead of studying at another German university. TU Clausthal is a great university widely known throughout the world. Also, the friendly, close atmosphere between professors and students is very important to me. I am very happy and proud to be a TUC student.«

Antranik Blibousuian, Armenia
Computer Science (Bachelor's)

Energy and Materials Physics (B.Sc.)

The Bachelor's degree program in Energy and Materials Physics provides understanding in physics, chemistry and material properties, thus creating the basis for a training in material physics involving energy-related course contents such as solar energy conversion and functional materials for energy conversion and energy storage. In addition, it provides an insight into energy resources and energy technologies and qualifies graduates for further education in the Master's degree programs regarding materials science and energy technology, and especially energy and materials physics.

Curriculum

- Fundamentals in classical physics, atomic and solid state physics, chemistry, mathematics and materials science
- Fossil and regenerative energy resources
- Functional materials: batteries, fuel cells, sensors
- Solar energy conversion
- Chemistry of energy functional materials
- Solid state analytics and measurement techniques
- Courses on social competence, scientific working and economics
- Industry internship
- 3 months for Bachelor's thesis

Academic Advisor

Prof. Dr. Winfried Daum
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Language of instruction: German

Energy and Mineral Resources (B.Sc.)

This program is subdivided into two optional areas of specialization:

- Energy and Mining Engineering
- Petroleum Engineering

Curriculum

With respect to a well-founded basic education in natural sciences and engineering, the primary modules are identical for both specifications.

Energy and Mining Engineering

- Surface and underground mining
- Mineral processing
- Geoinformatics, rock mechanics

Petroleum Engineering

- Reservoir engineering
- Drilling engineering
- Production engineering

Professional Profile and Job Market

A combination of theoretical education and practical training with the mining and petroleum industry qualifies the graduates to act on their own responsibility as petroleum and mining engineers in the international mining, petroleum industry, service companies and govermental bodies related to mining, and hydrocarbon and energy production.

Academic Advisor

Energy and Mining Engineering
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Petroleum Engineering
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Language of instruction: German and English (Petroleum Engineering modules only)

Geoenvironmental Engineering (B.Sc.)

This program is concerned with mastering the challenge of a steadily growing population and the destruction of ecological systems due to climate changes (e.g. flood waters, landslides) or the rise of subsurface and surface infrastructure projects.

Geoenvironmental Engineering trains future engineers to work in interdisciplinary fields of geotechnical engineering, applied geology, and environmental technology. The work of a geoenvironmental engineer consists of environmental consultation, and ground, water, waste and pollution investigations.

Curriculum

During the first year, courses will be offered on the fundamentals of mathematics and natural sciences in a combination of lecture- and lab-learning environments. During the second year, further introductory modules follow in geology, civil and geo-mechanical engineering, business administration, and law.

During the third year, specialized knowledge will be broadened and deepened through geotechnical modules, from which the contents are drawn from environmental protection technology. In addition, students will learn presentation techniques and complete their Bachelor's thesis.

Academic Advisor

Prof. Dr.-Ing. Norbert Meyer
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Language of instruction: German

Materials Science and Engineering (B.Sc.)

This program offers the challenges of optimizing the properties and processing of new materials, simultaneously combining fundamental basics of natural science and applications of engineering. Besides general lectures in mathematics, applied physics and chemistry, lectures in materials analysis, material science and engineering as well as in other engineering topics, students can choose their branch of study in either Material Science or Materials Engineering after one year.

This program is broadened by focusing the study on the materials themselves, such as metals, metallurgy, inorganic non-metals as well as polymers.

Professional Profile and Job Market

The job of the materials scientist and engineer involves working with materials ranging from metals to plastics and extending further to the most distinctly diverse and singular materials used for such specific purposes as in electronics, sensors, or “smart” windshields. This study program not only includes a 10-week industrial internship, but will also equip students for work in all technical areas, whether in improving available materials or in developing new materials.

Academic Advisor

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Language of instruction: German

Mechanical Engineering (B.Sc.)

Mechanical engineering focuses on the construction and production of machines, from transportation systems and machine tools to wind turbines and food processors. With a solid foundation – a combination of materials science, mechanics and thermodynamics – engineers will find solutions for our future challenges.

Curriculum

Beside a technical interest, students should be able to think analytically, creatively and apply ideas practically.

In addition to some specializations, this Bachelor's program is focused on the mathematical and scientific basis of mechanical engineering, including e.g. electrical engineering, design, information technology, and economics. Students can specialize in the following areas at TU Clausthal: design, fatigue, process automation, mechatronics and power systems.

The program includes a 20-week industrial internship and a Bachelor's thesis in the sixth semester.

Professional Profile and Job Market

Mechanical engineers work on ideas, design, calculation, construction, maintenance, optimization, research and development, production, and sales of machines, as well as in management.

Academic Advisor

Prof. Dr.-Ing. Armin Lohrengel
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Language of instruction: German

»I decided to do my doctorate at the TUC because I wanted to do research at a top-notch university. The research facilities and the academic support are outstanding.«

Rafael E. Hincapié, Venezuela
Petroleum Engineering (Doctorate)

»I wanted both: to study at a small, renowned university and to be in a unique environment perfect for all kinds of outdoor sports and activities. That‘s why I chose the TU Clausthal.«

Sigurd Flaatten, Norway
Power Systems Technologies (Bachelor‘s)

Power Systems Technologies (B.Sc.)

This program provides students with the engineering fundamentals necessary for dealing with a number of problems concerning power supply systems.
The initial semesters include the basics in mathematics, natural sciences and engineering.
In addition to these, the technical application of energy conversion as well as law and business administration are part of the curriculum.
It is mandatory for students to take part in an internship in a relevant industrial field for at least 8 weeks prior to and 10 weeks during the degree program.
The program concludes with a Bachelor's thesis at one of the corresponding institutes of the TU Clausthal or a company. Students have to give a presentation of the content and results of their thesis upon completion.
Graduates can choose to continue their studies in a Master's degree program or decide to work on challenging issues prominent in the energy industry.

Academic Advisor

Prof. Dr.-Ing. Hans-Peter Beck
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Language of instruction: German

Process Engineering / Chemical Engineering (B.Sc.)

Curriculum

During the first semesters, the students receive a basic education in mathematics, natural and engineering sciences, business administration, soft skills and foreign languages. Afterwards the engineering aspects of chemical reactions, thermal processes, mechanical processes, interface process and combustion are covered.

The students can specialize in one of the following areas: process, chemical or environmental engineering.

In the sixth semester, the students are required to write a Bachelor's thesis within a duration of three months.

Before and during the degree program, an industrial internship of 14 weeks has to be completed.

Graduates can choose to continue their studies in a Master's degree program or decide to work on challenging issues in industry, university, research facilities or governmental authorities.

Academic Advisor

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Language of instruction: German


SCOTT

Business Information Systems (M.Sc.)

This two-year full-time program teaches theoretical, methodological, empirical and product-related competences at the interface between computer science and business studies. The modular Master's program provides advanced knowledge, skills, and experience in designing, developing, and operating complex business information systems.

We offer a wide range of elective courses that permit our students to choose a specialization of their own interest, such as serious games, information systems engineering, or operations research. An important building block of the program are offers in research methods, project management, and soft skills, which are further deepened and applied in seminars, team-based development projects, and case studies. Students with a particular interest in research can select the research track of the program in which they conduct a larger self-directed research project to acquire an advanced level of research experience.

Students write a research-oriented or application-oriented Master's thesis under the guidance of a professor. Our graduates are qualified to master emerging technology trends, effectively work in project teams, understand research challenges, and pursue doctoral studies.

Academic Advisor

Prof. Dr. Jörg P. Müller
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Language of instruction: German

Business and Engineering (M.Sc.)

This program provides the opportunity to combine in-depth business and engineering studies. Therefore, it is focused on providing a well-balanced program with significant interaction between the administration and the engineering institutes at Clausthal University of Technology. This Master's degree program offers students the choice between the following three specializations:

- Production and Processes
- Energy and Raw Materials Management
- Material Technologies

Curriculum

In addition to a core set of courses in Business and Economics, such as Commercial Law, Industrial Organization, and Decision and Coordination, students also will be made proficient in engineering science. Students have to choose a set of courses in Engineering and Business and Economics according to their specialization. Finally, the program concludes with the preparation for the Master's thesis.

Academic Advisor

Prof. Dr. Winfried Steiner
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Language of instruction: German

Chemistry (M.Sc.)

This program is oriented towards materials chemistry and process technology. The course offers opportunities for individual specialization and early participation in research. Students can choose between two areas of specialization: Applied Chemistry and Polymer Chemistry.

Curriculum

In-depth modules in inorganic and analytical-, organic-, physical- and technical chemistry plus interdisciplinary courses.

Applied Chemistry

Two areas to be chosen:

- Solid-state chemistry and coordination chemistry
- Instrumental analytical chemistry
- Organic materials
- New molecules and mechanisms
- Special physical chemistry
- Special technical chemistry
- Environmental chemistry
- Chemistry of building materials
- Energy physics an materials physics
- Interface (electro) chemistry

Polymer Chemistry

- Macromolecular chemistry
- Physical chemistry of polymers
- Plastics processing

Research internships

- Two research internships
- One three-month project

Master's thesis

- Six months

Academic Advisor

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Language of instruction: German

Computer Science (M.Sc.)

This program offers broad fundamental and specialist knowledge in computer science. It qualifies students for a future professional career in industry, administration, and academia. Our students learn about theories, methods, architectures, and technologies, which allow them to utilize, develop, analyze, and optimize computer and information systems. We offer a wide range of elective courses that permit our students to choose a specialization of their own interest, such as information and knowledge engineering, software engineering, games engineering, and embedded systems. Interdisciplinary subjects such as business informatics, geoinformatics, informatics and sports, and operations research are offered, too.

Our students undergo training in research methods, project management, and soft skills. They engage in seminars and team-based development projects.

Students with a particular interest in research can select the research track of our program in which they conduct a larger self-directed research project to acquire an advanced level of research experience.

All of our students write a research thesis under the guidance of a professor. Our graduates are qualified to master emerging technology trends, understand research challenges, and pursue doctoral studies.

Academic Advisor

Prof. Dr. Sven Hartmann
Phone: +49 (0)5323 72-7100
E-mail: fachberatung-inf-msc@in.tu-clausthal.de

Language of instruction: German

»TU Clausthal was my first choice because Clausthal is a quiet, relaxing place to concentrate on one's studies. I also enjoy the caring assistance offered from the small university for international students.«

Sobtanfo Madadje, Cameroon
Chemistry (Bachelor's)

Economic Geology (M.Sc.)

This program combines the tradition of Clausthal University of Technology, linked with centuries of ore mining in the Harz Mountains, with its modern expertise in the prospection, exploration and extraction of the diverse georesources. Graduates are sought after to contribute to satisfying the fundamental needs of mankind in terms of geological energy sources, raw materials and water.

The program includes specialized classes in applied geosciences and deposits of raw materials. There are two main branches:

- Energy resources and geothermics
- Mineral deposits and groundwater

These specializations are among the most requested sectors for jobs in the geosciences, independently from financial cycles.

Studies consist of compulsory and elective modules which make individual study plans possible, such as focusing on petroleum geoscience, mineral deposits, geothermics/groundwater or geophysics. Training in geoscientific methods, including field courses, also plays an important role.

Applicants should hold a Bachelor's degree in Geoscience or an equivalent degree Curriculum. Admission may be subject to special conditions. Internships or professional experience is not required.

Academic Advisor

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Language of instruction: German

Energy and Materials Physics (M.Sc.)

The Master's degree program in Energy and Materials Physics offers the unique possibility of a broad thematic and content-depth training in materials physics and materials chemistry of renewable energy technologies. Special courses focus on photovoltaics, batteries, fuel cells and solid-state sensors and the necessary solid state physics basics. Involvement in research projects within research internships and the thesis prepare students for activities in industrial and academic research. Materials science, economics and legal studies content with close reference to the core issue of energy broaden students' knowledge, thus training and qualifying them for a variety of activities in industry and government sectors. The solid-state physics expertise at the TU Clausthal in combination with the capabilities of the Energy Research Centre Niedersachsen (EFZN), the Fraunhofer Heinrich Hertz Institute in neighboring Goslar, and the new Clausthaler Centre for Materials Engineering (CZM) make ideal prerequisites for versatile, research-driven studies.

Curriculum

- Solid state physics
- Semiconductors and energy functional interfaces
- Photovoltaics
- Fuel cells and chemical energy storage
- Batteries
- Solid state sensors
- Nanostructures and nano materials
- Materials for energy technology
- Management
- Energy law, energy and environmental economics
- Research internships
- Six months for Master's thesis

Academic Advisor

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Language of instruction: German

Environmental Process Engineering and Recycling (M.Sc.)

Continuously increasing prices of raw materials and advancing amounts of waste are the challenge of modern societies. This Master's degree program enables students to further their processing knowledge for utilizing waste as a new secondary raw material source, depositing unusable waste and remediating contaminated areas by mechanical, chemical and thermal unit operation steps.

Curriculum

Half of the lectures, exercises and seminars are in the fields of:

- Waste processing and utilization
- Recycling of metals, plastics and mineral fractions
- Thermal processes and depositing
- Soil remediation, waste water treatment and air pollution control
- Environmental analysis and toxicology
- Environmental management and accounting

One quarter is electives from the above fields for consolidation; specialization on other scopes is possible as well. The last quarter is reserved for practical courses, project work and the final Master's thesis.

Academic Advisor

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Language of instruction: German

Geoenvironmental Engineering (M.Sc.)

In recent years the knowledge and understanding of our anthropogenic impacts to the environment has been growing rapidly. It is generally accepted that a continuous global change triggers an increasing number of natural hazards with high losses and casualties. However, engineering processes have been investigated to reduce and avoid these impacts.

The concept of the degree program Geoenvironmental Engineering starts right here. Building on the general basics from the Bachelor's degree program, students will increase and deepen their knowledge in the areas of engineering, geosciences, statistics and geomonitoring. This Master's degree program teaches special methods for collecting, modeling and assessing different geological, anthropogenic events, and develops social skills. Due to the wide spectrum of causes, mechanisms and effects, as well as dedication and interest, students can choose from among four specializations:

- Geotechnical engineering
- Geoenvironmental media
- Geomonitoring
- Radioactive waste management.

These specializations emerge from joint courses in the areas of applied geosciences, measuring and data processing, geohazards, geomodeling and economic sciences. Additionally, there are optional student research projects (including oral presentations), a seminar thesis and the preparation of a Master's thesis.

Academic Advisor

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Language of instruction: German

Internet Technologies and Information Systems (M.Sc.)

This program offers broad fundamental and specialist knowledge in internet technologies and information systems (itis). We offer it in cooperation with our partner universities in Braunschweig, Hannover, and Göttingen.

Itis is an international program that is entirely conducted in English. Every student has a professor as their academic mentor, and participates in the activities of their mentor's research group. It is a program of excellence that qualifies students for a future career in academia, or industrial research and development.

In the first year, our students undertake advanced course work in distributed systems and algorithms, networking and communication, and data and information.

We offer a combination of on-campus lectures and tutorials, with modern modes of teaching, such as multimedia classes, webinars, video-conferences, social media, and online learning groups.

In the second year, our students undergo hands-on research training, undertake self-directed research in the context of a larger research endeavour, present their results in joint colloquia, and complete their research thesis under the guidance of a professor.

Our graduates have an advanced level of research experience and are qualified to pursue doctorate studies.

Academic Advisor

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Language of instruction: English


TU Clausthal
Clausthal University of Technology
SCHAEFFLER
FAG
Fraunhofer
IOSB

»A small university with students from all over the world; it is so easy to make friends here. The opportunity of having a close contact with the lecturers. So much close to the nature, it feels like living in the heart of a forest.«

Rami Shokri, Egypt
Mechanical Engineering (Master's)

Materials Science and Engineering (M.Sc.)

Admission Requirements

Successful completion of the Bachelor's degree in Materials Science and Engineering or another closely related degree program.

Curriculum

- Heterogeneous equilibria, thermodynamics and kinetics of solid-state reactions, non-destructive materials testing, project management, human resource management, industrial internship, and fatigue analysis

Specialization in the following fields:

- Metallurgical process engineering, foundry technology, deformation technology, materials science of metals, physical metallurgy, plastics processing, polymer materials, and glass, ceramics, and bonding agents

The degree course requires the completion of elective modules.

Lab courses

This degree requires scientific lab courses. For more detailed information, please contact our academic advisor.

Academic Advisor

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Language of instruction: German

Mechanical Engineering (M.Sc.)

Professional Profile and Job Market

Mechanical engineers are employed in production engineering, traffic engineering, medical technology, and chemical plant engineering. They are involved in the creation of efficient high quality products, contributing to solutions concerning current economic and social issues.

Admission Requirements

Successful completion of the Bachelor's degree in Mechanical Engineering/Mechatronics or any closely related Mechanical Engineering degree program.

Curriculum

- Mathematics
- Mechanical vibrations
- Simulation methods
- Material engineering
- Fatigue strength/tribology
- Mechatronics
- Constructions
- Design
- Materials

Interdisciplinary Topics

- Technical English
- Quality Management

The Master's degree courses are based on Bachelor's degree programs or comparable degree programs. Due to scientific specialization, the Master's degree courses develop qualifications for demanding professional tasks.

Academic Advisor

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Language of instruction: German

Mining Engineering (M.Sc.)

The program Mining Engineering, offers students intensive study opportunities over a broad spectrum of fields. The students become skilled and equipped to face challenges in the industry and are also trained to develop and apply up-to-date scientific tools and techniques. The program aims at empowering students with management and communication skills in addition to technical knowledge. Numerous specialization topics are available, such as:

- Geostatistics and mine planning
- Underground and open pit mining technology
- Rock mechanics and drilling technologies
- Mine health and safety regulations
- Ventilation and climatization
- Mineral processing
- Mine surveying and geoinformation systems
- Mining and the environment

Job Opportunities

Resources is a growing market. This is inevitably followed by a continuously increasing need for specialists who are able to recognize and solve interdisciplinary problems from the fields of raw material production, environmental engineering, and geology. Coping with the contrast between using and preserving our planet in terms of sustainability is today's mining engineer's challenge. The program provides the graduate with scientific knowledge and enables systematic preparation for advanced job requirements, leadership and technical positions in industry as well as in field of research and development.

Academic Advisor

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Language of instruction: English

Power Systems Engineering (M.Sc.)

This program in Power Systems Engineering at TU Clausthal accepts qualified students with a Bachelor's degree in power systems technology, mechanical, electrical or process engineering. The program focuses on giving further insight into basic subjects, but also covers more specialized topics such as power plant technology, fluid mechanics, and electrical and control engineering. These will be accompanied by subjects covering legal aspects of the energy sector and the power industry.

A quarter of the program is based on elective subjects, so students can choose their specialization field on the approval of their program advisor.

The curriculum also includes group project work.

The program ends with the Master's thesis at one of the TU Clausthal institutes or a company. Students must also give a presentation of the content and results upon completion.

Possible working fields for the graduates of Power Systems Engineering in the context of the energy system integration are energy conversion, energy storage, energy transport and power generation.

Academic Advisor

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Language of instruction: German

Process Engineering / Chemical Engineering (M.Sc.)

Admission Requirements

Completion of a Bachelor's degree in Process or Chemical Engineering or another closely related degree.

This degree program is directed at those seeking further qualification in the field of process or chemical engineering. The program is composed of general modules with corresponding lectures, and an array of selective modules relating to a subject matter of a chosen area of specialization. The four specialization areas are orientated around the main research topics of the involved institutes. These research activities cover the fields of intensification of chemical processes, innovative separation technologies, optimization of energy efficiencies of technical processes, and the development of new materials and their necessary production processes.

Mandatory courses include:

- Chemical reaction engineering
- Thermal process engineering
- Mechanical process engineering
- Combustion technologies
- Bioprocess engineering
- Modeling and simulation in process engineering

Fields of Specialization:

- Chemical processes
- Energy
- New materials
- Life science engineering

Master's thesis:

- Six months

Academic Advisor

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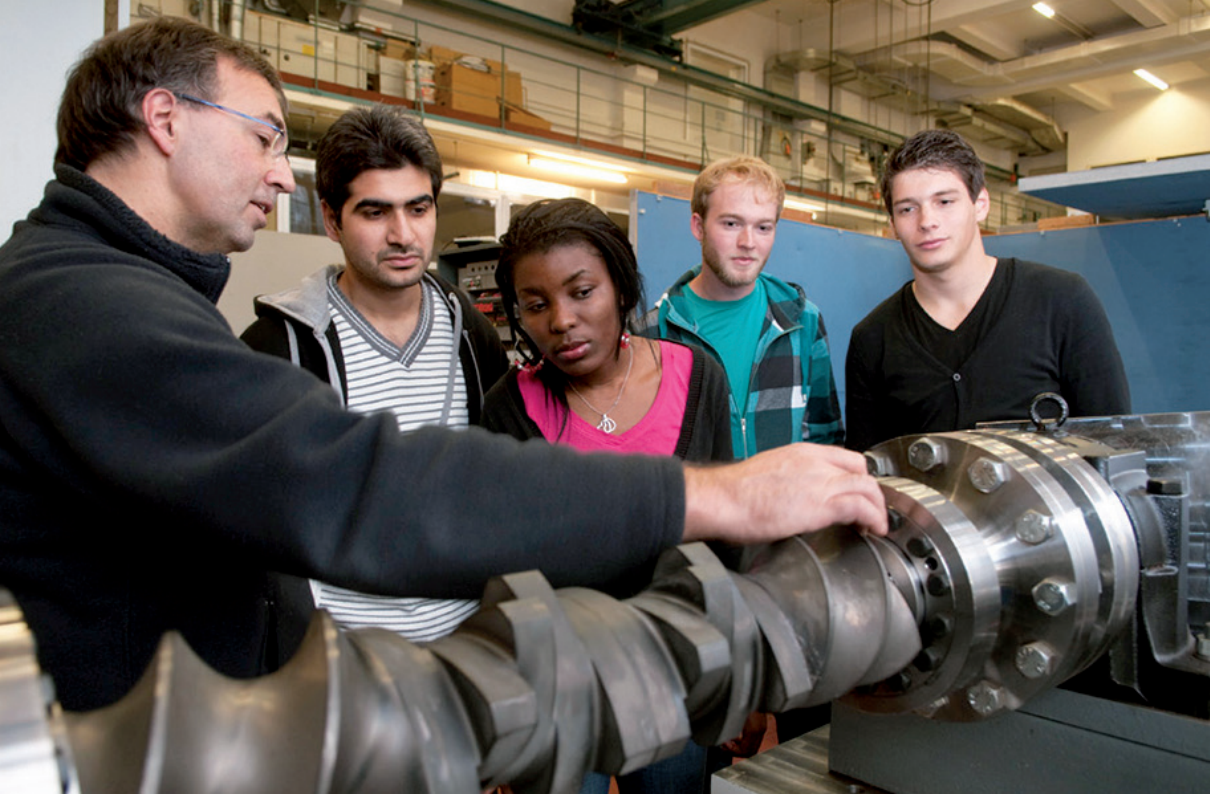
Language of instruction: German



Petroleum Engineering (M.Sc.)

Petroleum Engineering is the field of knowledge which includes all aspects of oil and gas technology. It encompasses the evaluation of hydrocarbon reservoirs, their development by drilling wells, economical production and processing of hydrocarbons in a marketable quality as well as their storage and distribution.
Admission requires a B.Sc. graduation in Petroleum Engineering or equal.
There are two areas of specialization:

Reservoir Management
- Data acquisition & evaluation
- Enhanced hydrocarbon recovery
- Reservoir modeling & simulation

Drilling/Production
- Drilling engineering
- Production engineering
- Drilling and production supplement courses

General Modules
- Management, economics and law
- Communication
- Group project
- Master's thesis

Combination of theoretical education and practical training with the oil and gas industry qualifies the graduates to act on their own responsibility as petroleum engineers as well as to take over leading positions in the international petroleum industry, service companies and govermental bodies related to the hydrocarbon and energy production.

Contact

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Language of instruction: English

Technical Management (M.Sc.)

This program builds upon the business administration Bachelor's degree program. Due to the technical areas of specialization, students are prepared for the development of interdisciplinary approaches to combining management and engineering. Students learn the latest research in their field and are trained to apply it in different professional contexts. Graduates of the program are qualified to integrate different perspectives and to communicate them to the experts involved in the respective fields.

Curriculum

In accordance with the quantitative profile of the Bachelor's degree program, analytical decision-making is at the very heart of the curriculum, which is complemented by elements of the selected technical minor. Students gain in-depth expertise in the fields of business administration, optimization and economics, as well as basic knowledge from their chosen area of specialization. At present, specializations are offered in production technology, extraction of raw materials, energy management and modelling and simulation. Two seminars, electives, and the Master's thesis allow the students to tail the program to individual preferences.

Academic Advisor

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Language of instruction: German

»When I think of Clausthal, the University, its surroundings and cultural diversity come to mind. These are the key elements for educational success.«

Xiaochen Fu, China
Technical Management
(Master's)

»I have always wanted to study abroad and I have found Clausthal is the perfect place. Being in close contact with my professors is a big advantage for my studies.«

Abdoul Nouro Bangagne, Gabon
Energy and Mineral Materials
(Master's)

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