Technical University
of **Leoben**

**Move mountains**

# BACHELOR'S PROGRAMMES

RESOURCES
MATERIALS
PROCESSES

unileoben.ac.at

**27** Master's programmes

**13** Bachelor's programmes

**German & English**
speaking environment

**Unique internships**
in cooperation with industry

**Excellent career opportunities**
significantly higher income

**Future-oriented careers**
national & international

**Life-long network**
**1,000+**
graduates as members in our Alumni Club

**Percentage of female students**
**≈30%**

**Start-up support**
achieving an **80%** success rate

**International mobility**
**150** partner universities globally

**Culture @MUL**
university choir, string orchestra, brass band

**70+** sports courses

**20+** language courses

**Personal environment** **5:1** student–to–professor/lecturer ratio

**International community**
**3,000** students from **89** different countries

**Study support**
study buddies, tutorials, peer–teaching

**Jobs @ TU Leoben**
**≈10%** of our students are employed at MUL

Technical University of **Leoben**

*April 2025*

# FACTS & FIGURES

Technical University of Leoben stands for excellent scholarship, outstanding education, and absolute peak performance in research and teaching. Five core values – our "DNA" – determine all our actions: energy efficiency, climate neutrality, sustainability, zero waste, and circular design. After all, the major social challenges of our time in the areas of resources, climate, energy, and environment can only be overcome with technical and scientific methods.

To prepare our students for their future roles as decision makers, we offer them optimal support from our teachers and excellent equipment on campus. Our students therefore receive the tools they need to tackle all major environmental issues.

At the same time, the manageable size of our university offers a decisive advantage: The intensive contact among the students as well as to the teachers makes it possible to quickly solve challenges in everyday student life. Every day, we actively work towards improving the present and future and to make it sustainable.

## ORIENTATION

The programmes offered at Technical University of Leoben are geared towards the "circular economy" from raw material extraction and processing to metallurgy, energy supplies, high-performance materials, process and product engineering right up to environmental and climate protection technology and recycling. The sustainability of all processes is a key concern of Montanuniversität Leoben. The programmes offered are complemented with interdisciplinary studies, such as Industrial Logistics, Industrial Data Science, Circular Engineering, and Responsible Consumption and Production.

## FIRST YEAR OF STUDY

The first year of study is largely organised the same for everyone as an orientation phase so that at the end of the first year, the field of study can be changed easily without losing any time. During these two semesters, first-year students – fondly referred to as "Schwammerl" ("mushrooms") in Leoben – from various types of schools are brought to the same level. The timetable begins with basic subjects combined with courses, such as the so-called "Do-it Labs", which give initial practical insights into the subject.

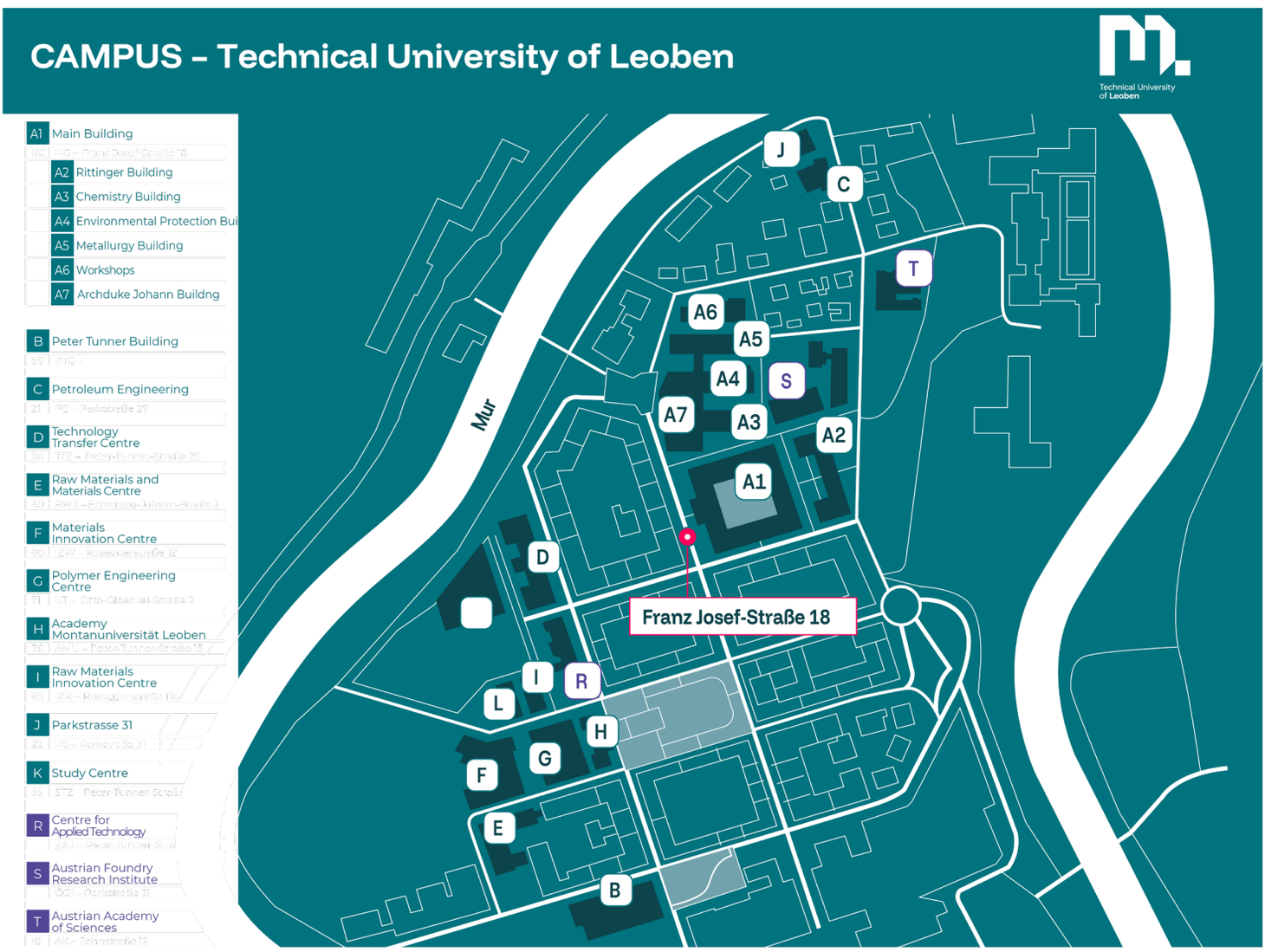
## DEGREE

All undergraduate fields of study are completed with the academic degree "BSc". In the master's programme, there is scientific specialisation with the completion of a master's thesis (degree of "Dipl.-Ing." / "MSc").
After this, a doctoral programme can be started. During their educational programme, all students must complete a work placement at a relevant company; one semester is planned for this in the course timetable.

## CAREER PROSPECTS

The Technical University of Leoben has always been closely linked with industry and business. Through numerous projects with companies, the students are integrated into a worldwide network very early on, which makes it much easier for them to start their careers. Thanks to the practical instruction, the students are always learning the state of the art and can quickly find their way in their professional life.
Due to their unique education, our graduates are among the most sought-after academics. After finishing their studies, they have excellent job opportunities open to them both at home and abroad.

Explore our campus




## UNIVERSITY CAMPUS

# EVERYTHING AT A GLANCE

# UNIVERSITY TOWN OF LEOBEN –

# TRADITION & MODERNITY

As the second largest city in Styria, Leoben is a very interesting location, both for students and scientists. The symbiotic relationship among the unique fields of study, basic research, and close cooperation with international industry offers the best prospects for students and the research location of Leoben.

## SPORT AND RECREATION

When not studying, the students benefit from the high quality of life and the wide range of sports and recreation opportunities. Whether hiking, climbing, running, or skiing, Leoben offers the perfect conditions for all outdoor sports enthusiasts. The unique focus of the Technical University of Leoben is also reflected in the special flair of the university town, because mining customs and traditions are writ large in Leoben.

## EVENTS

There is also a lot happening in the Leoben events scene. One highlight on the event calendar of this mining town is the "Gösser Kirtag" (town fair). Thousands of guests from near and far visit the longest fair strip in Austria every year and enjoy a glass of Leoben beer in the Gösser beer tent.

## PURE ENJOYMENT

Anyone who would like to learn about how this fine beer is made is in the right place in the Leoben–Göss brewery. History buffs can learn more about the origin, history, and beer culture in the brewery museum and will find out what makes Leoben beer so special: quality and the art of top-notch brewing.

## WATER FUN AND RELAXATION

Fun and relaxation are to be had in the unique water adventure world of "Asia Spa" where something unparalleled succeeded there: the synthesis of sports, fun, and fitness along with complete relaxation and pure wellness. The facility, which spans 45,000 square metres, is located near the university campus.

## SHOPPING AND CULTURE

LeobenCityShopping (LCS) has given the shopping experience in Leoben a new dimension. In the middle of the old town centre, and within the historical walls of the former Dominican monastery, there is a diverse range of stores, bars, and restaurants. Major renowned historical and cultural exhibitions take place regularly in the Leoben art gallery.

## 250 EUROS FOR MAKING LEOBEN PRIMARY RESIDENCE

To make the move to Leoben as pleasant as possible, the town council of Leoben decided that students of the Technical University of Leoben will receive a payment from the town of Leoben in the form of LE vouchers worth 250 euros when they first register Leoben as their primary residence. The condition for this is registering Leoben as their primary residence. Each subsequent year, they will receive a payment of 100 euros in the form LE vouchers if the students can verify that Leoben is their primary residence, with November 1st as the effective date.

# HOUSING IN LEOBEN

## YOUR HOME IN THE HEART OF STYRIA

### STUDENT RESIDENCES

OeAD-Guesthouse MINEROOM_____housing.oead.at

Akademikerhilfe_____akademikerhilfe.at

Schlägel und Eisen_____studentenheim.info

Greenbox_____greenbox.co.at

Collegium Josefinum_____josefinum.com

WIST Student Residences_____wist-steiermark.at

Students City Lodge Leoben_____students-citylodge.at

Living Campus_____livingcampus.at

MILESTONE Student Living_____milestone.net

### STUDENT RESIDENCES OPERATED BY STUDENTS' ASSOCIATIONS:

Studentisches Sozialwerk_____vereine.unileoben.ac.at/studsozw

Weißes Kreuz_____vereine.unileoben.ac.at/weisseskreuz

Montanen-Studenten-Wohnhilfe_____studentenheim-leoben.at

Steirisches Erz_____corpserz.com

Montanistenhilfe Schacht"_____corps-schacht.at

### ONLINE ACCOMMODATION SERVICES

wohnen-leoben.at (ÖH Leoben)

Check our website for housing information and student residences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# LIVING THE ADVENTURE

## WHY STUDY IN AUSTRIA?

Great social security, economic stability, health care, culture, education and infrastructure are among the many reasons why Austria is an ideal place to study and live. And exploring the breathtaking scenery of Austria will turn your stay the adventure of a lifetime.

## WHY STUDY AT MONTANUNIVERSITÄT LEOBEN?

Every year, close to 1,000 international students enrich the Technical University of Leoben community and enjoy the advantages of a cozy city in the heart of Styria. Why do they choose to study here?

- Highly relevant study programmes in the field of resources development and sustainability
- Ranked in the top 8 % of universities worldwide
- High quality teaching and training with the world's best in their field
- Excellent career prospects
- Low tuition fees and low cost of living compared to other European or Austrian cities
- One of the safest environments globally
- Spectacular geographical location and leisure opportunities

## LANGUAGE

The official language of Austria is German, but each area of Austria has its own dialect. If you don't know German, we recommend making it a priority to study the language as it will make your experience easier and more enjoyable.

Bachelor's programmes are taught in German – except for Circular Engineering and Responsible Consumption and Production (EURECA-PRO).

A number of master's programmes are taught in English. Incoming bachelor's students are allowed to take master's classes if they have already completed min. 90 ECTS in their bachelor's studies.

## COSTS OF LIVING

Compared to other Austrian cities like Vienna or Graz, Leoben is very affordable. The costs of housing depend on where and in which kind of apartment you choose to stay. A typical monthly budget in Leoben for one person might look like this:

- Approximate rent: 300 to 500 euros
- Food (incl. occasional visits to restaurants): 300 euros
- Public transport: 30 to 50 euros

- Total (excl. expenses for clothing, phone bills, hygiene articles, books, leisure activities..): 650 to 1,000 euros

For more information on the cost of living in Austria, go to https://studyinaustria.at/en/living/living-costs

## CLIMATE

Austria experiences four distinct seasons. Winters start around December and last until the end of March. Depending on the region, they can get quite cold with the average temperatures at around 0 °C and occasionally exceeding –10 °C.
In summer (from June to August), the average temperatures range from 22 to 26 °C, sometimes exceeding 35 °C. Conditions in spring and autumn vary – sometimes it can be quite warm and sunny, and then again rainy and chilly. Thunderstorms occur frequently in summer and snowfall is common in winter.

The quality of the degree programmes is, of course, the most important factor in choosing Montanuniversität Leoben. But the city, the country and the people also make it an easy choice.

## BACHELOR'S PROGRAMMES IN ENGLISH

- Circular Engineering
- Responsible Consumption and Production (EURECA-PRO)
- Geoenergy Engineering

## MASTER'S PROGRAMMES IN ENGLISH

- Applied Geosciences
- Geoenergy Engineering
- Petroleum Engineering
- Mining and Tunnelling
- Raw Materials Engineering
- Polymer Science and Engineering
- Materials Science
- Circular Engineering
- Digital Civil Engineering Science
- Industrial Data Science
- Industrial Logistics
- Metallurgical Engineering
- Safety and Disaster Management

## INTERNATIONAL STUDY PROGRAMMES

- International Master of Science in Advanced Mineral Resources Development
- International Master of Science in Applied and Exploration Geophysics
- International Master of Science in Building Materials and Ceramics
- Joint International Master Program in Petroleum Engineering
- EM Joint Master in Sustainable Mineral and Metal Processing Engineering
- Advanced Materials Science and Engineering
- International Master in Sustainable Materials
- Joint Master's Programme in Responsible Consumption and Production (EURECA-PRO) *

**This programme is delivered within the framwork of the Joint MSc in New Science and Technology*

# WELCOME EXCHANGE STUDENTS

You are about to embark on an exciting adventure that will enrich your future life not only academically but also personally. A successful preparation for your exchange will result in academic success and an unforgettable experience.

## THE JOURNEY BEGINS

At the beginning of the semester, MIRO (Montanuniversität International Relations Office) organises a compulsory Welcome Orientation Session for all new incoming students to provide a jump start. In addition, the mandatory Intensive English Course gives our exchange students not only the opportunity to polish their English language skills but also to get to know each other.

## EVENTS

Furthermore, MIRO organises a variety of events to give exchange students not only the chance to get to know Austrian traditions but also to learn more about the different traditions from exchange students from all over the world.

- Free Fridays: celebrating special festivals like carnival or Easter, to cook together or just to enjoy a traditional Apple Strudel
- Field Trips: going hiking, visting how traditional houses from all over Austria were built or enjoying famous Christmas Markets, etc.
- LE Lauf (Leoben Run)
- Potluck Dinner: trying dishes from all over the world with other students
- Christmas Party: celebrating Christmas the Austrian way

## LANGUAGE REQUIREMENTS FOR EXCHANGE STUDENTS

For being accepted as an exchange student at Technical University of Leoben you have to proof an English Level of at least Level B2 according to CEFR.
The following certificates are accepted:
- TOEFL (78 points)
- IELTS (6.0)
- Cambridge Certificates or certificates that have been issued by a language center or language institute of your home university

Please note: The certificate has to test all four skills (listening, reading, writing/grammar, speaking) and must not be older than two years.

## DEADLINES FOR EXCHANGE STUDENTS

Nomination Deadline
Winter semester/academic year: May 1
Summer semester: October 1

Application Deadline
Third-country nationals:
Winter semester/academic year: May 151
Summer semester: October 15
EU/EEA nationals:
Winter semester/academic year: May 31
Summer semester: October 31

You would like to study at Technical University of Leoben as an exchage semester? Find more information on the MIRO website

international@unileoben.ac.at

# INTERNATIONAL DEGREE STUDENTS

In general, applications for studying at Technical University of Leoben as an international degree student can be submitted throughout the year.
However, please note that there are certain application deadlines for Joint Degree Programmes.

## APPLICATION BACHELOR'S AND MASTER'S PROGRAMMES

For bachelor's and master's programmes held in German, applicants need to submit proof of German language proficiency at level A2 (according to CEFR) at the time of applying.

For enrollment as a full-degree student, you need to provide German skills at level B2. The university only accepts definite certificates that may not be older than two years. If you cannot yet provide proof of German language skills at the level B2, you can be admitted to Technical University of Leoben as a non-degree student and attend the University Preparation Progamme to reach the required level of language proficiency.

For bachelor's and master's degrees held in English, applicants need to submit proof of English language proficiency at level B2. You can proove the required language proficiency with IELTS (minimum 6 points), TOEFL ibt (minimum 80 points) or TOEFL pbt (minimum 550 points) or equivalent tests.
Students whose mother tongue is English or who have already completed an English study programme are exempted

## UNIVERSITY PREPARATION PROGRAMME

This programme prepares international students who have been admitted to Technical University of Leoben for additional or supplementary exams. If the higher education entrance qualification obtained abroad is not equivalent to the Austrian school leaving certificate (Matura), the necessary supplementary examinations must be completed before the start of studies. This can be done as a non-degree student in the university preparation programme.

## DO I NEED TO PAY TUITION FEE?

Every student in Austria has to pay the Students' Union fee (less than 25 euros per semester).

In addition, third country nationals have to pay tuition fees (726.72 euros per semester).

EU/EEA/Swiss nationals do not need to pay tuition fees, as long as they complete their studies within the minimum duration of studies (plus two extra semesters). If you cannot complete your studies within this time, you have to pay tuition fees (363.36 euros per semester).

www.unileoben.ac.at/en/contact/

Are you interested in pursuing a degree at Technical University of Leoben? Get more information on all the necesary steps!

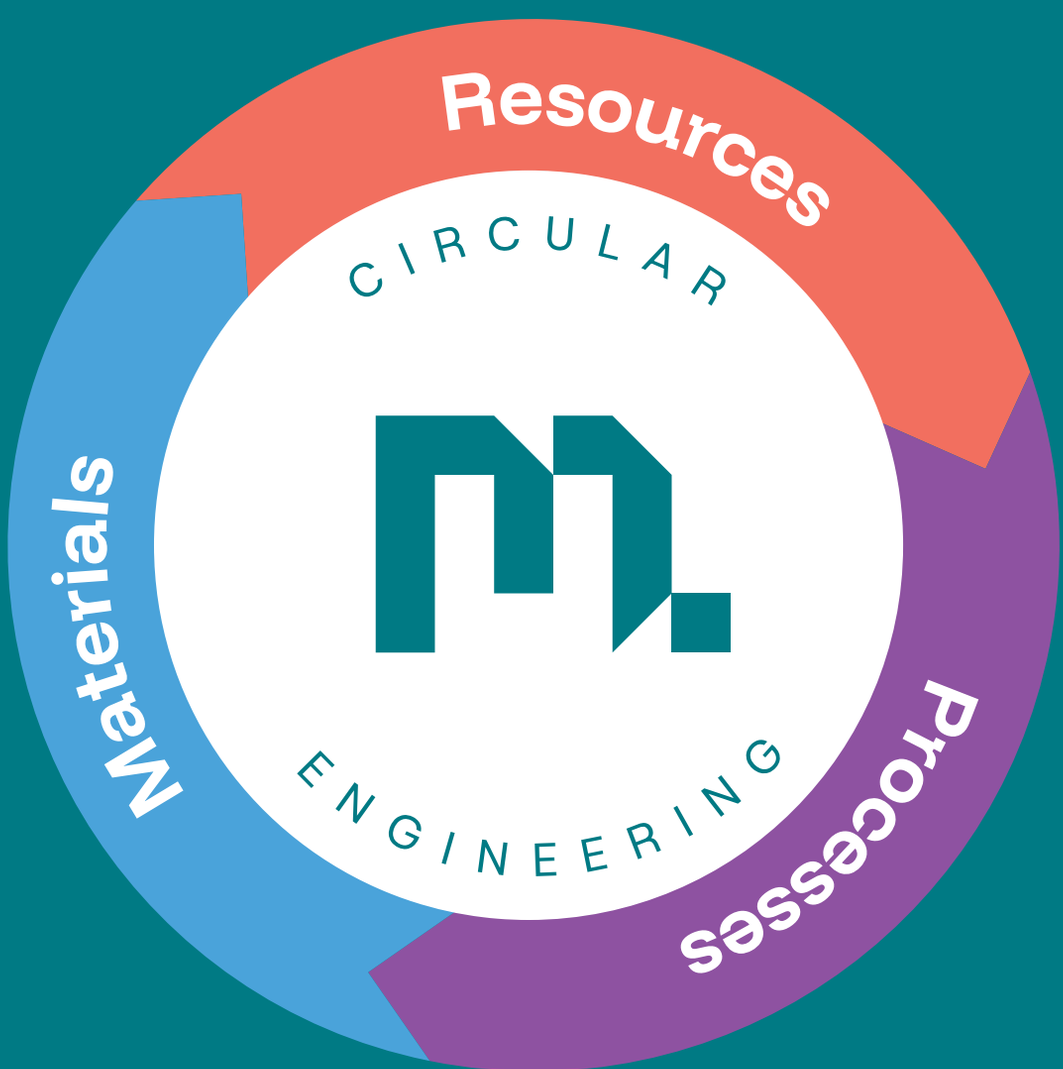
info@unileoben.ac.at

# Move mountains

## WITH YOUR STUDIES AT THE TECHNICAL UNIVERSITY OF LEOBEN

The Technical University of Leoben embodies innovative research and teaching in future-oriented technologies. Our diverse study programme is divided into three technological core areas centered around circular engineering – in other words, a circular economy with focus on product manufacturing, including

- knowledge of raw materials and their resource-efficient extraction,
- production methods and sustainable processes
- and the development of innovative components and materials.




The world-renowned Technical University of Leoben offers you a unique study programme with a practical orientation that will prepare you for a successful career in industry, research, and business.

## RESOURCES

The basis of our modern society is made up of mineral raw materials. Technical University of Leoben has made it their job to make the extraction, treatment, and processing of these very important resources sustainable.

- Applied Geosciences (BSc)
- Mineral Resources Engineering (BSc)
- Geoenergy Engineering (BSc) *in english*
- Energy Engineering (BSc)

## PROCESSES

In order to leave behind a healthy planet for future generations, a change is necessary. Circular Engineers are the mainstay for upcoming challenges and broaden their knowledge also at our international partner universities.

- Metallurgy and Metal Recycling (BSc)
- Industrial Logistics (BSc)
- Industrial Data Science (BSc)
- Environmental and Climate Protection Technology (BSc) *in english*
- Recycling (BSc)
- Circular Engineering (BSc) *in english*
- Responsible Consumption and Production (EURECA-PRO) (BSc) *in english*

## MATERIALS

A green future begins with the design of materials. With the right material properties, resources can be saved and products better recycled later. We design materials by optimizing their properties.

- Materials Science and Technology (BSc)
  - Major in Polymer Science and Technology
  - Major in Metals, Ceramics and Functional Material
- Mechanical Engineering (BSc)

International and practical: At Technical University of Leoben, people with industrial experience will teach you. You will work on practice-oriented projects and can expand your horizons with excursions and years abroad.

# GETTING STARTED

There are no academic selection processes at Technical University of Leoben . All students can enrol with a secondary school certificate. Technical schooling is not a requirement. Curiosity, creativity, and motivation to contribute to the environment and society are important characteristics for future Leoben students.

## FIRST YEAR OF STUDY TOGETHER

The first year of study is nearly identical for all students so that the field of study can be changed during this period without losing any time. The first two semesters convey the necessary basic knowledge in chemistry, physics, mathematics, etc., required for a technical programme.

## ONBOARDING AND "BAKK FUNDAMENTALS"

Young students will feel at ease and be accompanied even better with a new "onboarding" phase. To make the world a little bit better in the future using new technologies, a strong scientific foundation is required. The students will furthermore be boosted in their creativity and bold thinking. As a small university, the technical University of Leoben offers the best conditions for this, e.g., within the framework of the new and innovative "Do-it Labs".

## DO-IT LABS

In the "Do-it Labs", students work in small groups on various practical problems. They not only receive support from the teachers, but also from the older students.

## ORIENTATION PHASE (STEOP)

In the first six weeks of the winter semester, within the framework of the "STEOP", the courses "Basic academic skills" and "Introduction to STEM subjects" are completed. In "Basic academic skills", the essentials of rhetoric and presentation technology or how to work with Office applications are taught. The course "Introduction to STEM subjects" offers an overview of the basic science and mathematics required for the field of study.

In addition to becoming familiar with the basic terms in the respective subjects, first-year students will also gain an understanding of the thematic interconnection of the various subjects. If there are any questions, the students from higher semesters will be there to help so that the "STEOP" will be completed in November.

## TUTORIAL PROJECT BY THE AUSTRIAN STUDENT UNION LEOBEN (ÖH LEOBEN)

The Technical University of Leoben is committed to personal support from the beginning. To make the transition into university life easier for new students – fondly referred to as "Schwammerl" ("mushrooms") in Leoben – they are given advice and assistance by older students within the framework of the tutorial project of the Austrian Student Union Leoben (ÖH Leoben) starting on their first day at the university. Within these tutorial groups, friendships often develop, which can last throughout one's studies at the university and beyond.

## ENROLMENT & PRE-REGISTRATION

Are you made for the future and want to change the world?
Here are the first steps you must take:

1) Registration in MUonline
2) Online pre-registration for the chosen field of study.

ssc.unileoben.ac.at
ssc@unileoben.ac.at

# BACHELOR'S PROGRAMME

## 1ST TO 2ND SEMESTERS

Largely the same for all fields of study
Basic academic skills, introduction to STEM subjects, chemistry, mathematics, physics, technical mechanics, digital skills, and basic statistics and introduction to the field of study

## 3RD TO 7TH SEMESTERS

The bachelor's programme (210 ECTS credits) conveys basic entry-level knowledge for professional life.
- Work placement
- Writing a bachelor's thesis
- Degree: Bachelor of Science (BSc)
- Bachelor's thesis

# MASTER'S PROGRAMME

## 8TH TO 11TH SEMESTERS

In the master's programme (120 ECTS credits), the technical knowledge gained during the bachelor's programme is deepened.

- Writing a master's thesis
- Degree: Diplomingenieur (Dipl.-Ing. / Master's of Science (MSc)

# OUR STUDENTS' EXPERIENCES

Edin Mujkanovic
Metallurgy and Metal Cycles

I decided on Metallurgy as a field of study because I find it very interesting that there is no product that is not made of metal or does not require metal in order to be manufactured. Furthermore, my great interest in cars also led me towards Metallurgy.

Stefanie Luschin
Applied Geosciences

I love nature and the mountains and decided to study Applied Geosciences. My studies form a unique relationship among physics, chemistry, biology, and mathematics. My scientific interest is perfectly combined to work on current problems with the knowledge of the past.

Olga Olvia Yakunina
Circular Engineering

I chose to study Circular Engineering to contribute towards the transition to a circular economy, where renewable energy sources, minimal waste, and retaining material value are a priority. I was personally interested in the concept of optimizing product life cycles and technical processes and finding long-term solutions with the contribution of emerging technologies to reduce the ecological footprint.

Boris Mayer
Recycling

Ever since I was in secondary school (AHS), it was clear to me that I would eventually land at a technical university to study environmental protection. When I heard about Recycling at Montanuniversität Leoben, I went to the next information day and my decision was made! The cohesion among the students is unique here.

Sophie Mitterecker
Environmental Protection
and Climate Protection Technology

After finishing secondary school (AHS) with a focus on languages, I was looking for a new challenge. This field of study is a future-oriented link between all other directions and is universally applicable. I can optimally combine my interest in environmental protection with my technical affinity.

Julia Schneider
Materials Science and Engineering / Polymer Engineering
and Science

Without plastics our daily life would not work. So, even before I finished secondary school (HTL), it was clear to me that I wanted to continue my education in this field of study. To be able to contribute towards the sustainable and economical design of the production, processing, and recycling of plastics, I decided to study at Montanuniversität Leoben.

About one fifth of the students work at the Technical University of Leoben.

Get more stories and insights into the every day life and our science projects at comMULity

Oscar Wallner
Responsible Consumption and Production (EURECA-PRO)

In the bachelor's programme Responsible Consumption and Production, the goal is to set new standards in business, because a new age is dawning, which also means new challenges. To create a better future and to still be in demand in every business sector, I decided to pursue this unique engineering programme.

Martin Hatzl
Energy Engineering

The key issues in our society are the energy revolution, conservation of resources, and efficient use of energy. These points and the family-like environment at Technical University of Leoben convinced me to choose Energy Engineering.

Valerie Kaufmann
Mechanical Engineering

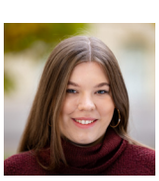
After my vocational training to become a kindergarten teacher, I wanted to pursue my second biggest passion: science. I ultimately chose to study Mechanical Engineering and am still fascinated by the diverse educational areas. I felt comfortable and welcome right from the very beginning.

Julia Schmelz
Industrial Data Science

After finishing high school at a school focused on languages, it was clear to me that I wanted to go in a technical direction. The analysis of production process data can help to conserve resources and contribute towards environmental protection, which is fascinating to me. The diverse opportunities available to me at Technical University of Leoben convinced me.

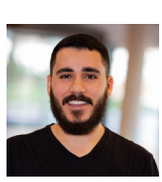
Caro Kaiser
Mineral Resources Engineering

I have always been interested in technology, and after finishing secondary school (HTL), I wanted to find a more concrete specialisation. Therefore, I decided on this field of study, because it offers the opportunity to specialise in various areas and to become a real expert in this area.



Rebekka Arnold
Industrial Logistics

The Industrial Logistics field of study at Technical University of Leoben is the perfect combination of technology, business administration, and information technology.



Sohil Elwaseif
Geoenergy Engineering

A few of the reasons I chose to study at Technical University of Leoben are the university's internationally renowned and well-rounded curriculum, work placement opportunities, and great teaching staff to student ratio.

BACHELOR

# APPLIED GEOSCIENCES

ADVANCED RESOURCES

# APPLIED GEOSCIENCES

Traditionally, geosciences have been used for the exploration of natural resources, such as fossil fuels. Today, if we are to manage the transition to renewable energies, we need geosciences more than ever: We must find deep geothermal reservoirs to provide renewable heat and power for our cities. We must be able to store green hydrogen in the subsurface to provide for periods when the renewable energy production does not meet the demands. And we need to do that safely, without harm to our aquifers and environment. We also need raw materials to build the wind turbines and batteries required for a sustainable energy supply. And we must study the subsurface carefully if we want to build new railroad tracks and tunnels that can accommodate heavy loads and high speed.

The study programme Applied Geosciences produces the specialists who can master our future because they understand all aspects of the subsurface, from its physical and chemical properties, to the migration of fluids, to its resource potential.

## WHAT QUALIFICATIONS SHOULD YOU HAVE?

Geoscience is one of the most interdisciplinary natural sciences. You should be able to look at things from very different angles. You should enjoy field work, from taking rock samples and mapping geological units to performing geophysical surveys. You should also be enthusiastic about analysing samples in a lab, and about processing data to create comprehensive computer models of the subsurface. If you are also ready to travel where the work demands, you are ready for this exciting study programme.

## WHAT CAN YOU EXPECT DURING YOUR BSC PROGRAMME?

Applied Geosciences is at the interface between natural and engineering sciences.
In addition to essentials of chemistry, physics and mathematics you'll study.

- The internal structure and history of the earth, the processes in its interior and on the surface,
- Mineralogy, petrology and geochemistry, to understand the distribution of elements in the geosphere and biosphere, and the formation of minerals and rocks,
- Geophysical methods to measure and image the physical characteristics of the subsurface,
- Sedimentology to read the paleoclimatic information and to understand earth's history and the potential of sedimentary rocks to store energy resources.
- Geomechanics to understand the requirements of subsurface buildings.
- Hydrogeology and geothermal energy to understand groundwater flows and their potential as energy resource.
- Economic Geology to understand how mineral deposits are formed and how they are to be explored.

Your theoretical studies will be accompanied by intensive training in the lab and in the field, and by an industrial internship.

## WHAT CAN YOU EXPECT AFTER YOUR BSC PROGRAMME?

Some geoscientists work in the consulting and engineering sector, where they assess the subsurface for building or remediation projects, for groundwater supply, for environmental protection, or for the detection of unexploded ordnance. Other geoscientists work for mining and commodity companies. Some geoscientists work for public authorities, others stay at a university or research institution as a professional scientists. Graduates of the Technical University of Leoben generally enjoy a competitive advantage on the job market, because they are known for their excellent engineering skills.

### Academic degrees / duration of studies

- BSc / 7 semesters (210 ECTS)
- Dipl.-Ing. / 4 semesters (120 ECTS)
- Dr.mont. / 6 semesters (180 ECTS)

### Bachelor's programme areas of focus

- Fundamentals of geosciences
- Raw materials geology
- Applied mineralogy
- Environmental geology
- Petroleum geology
- Applied geophysics
- Geotechnology

### Potential master's programmes

- Applied Geosciences
- International Master of Science in Applied and Exploration Geophysics

### Programme director

Univ.-Prof. Dipl.-Geophys. Dr.
Florian Bleibinhaus

BACHELOR

# MINERAL RESOURCES ENGINEERING

ADVANCED RESOURCES

# MINERAL RESOURCES ENGINEERING

Since the Stone Age, they have been extracted and used by humans, and in the 21st century, they are indispensable in our daily lives. Whether as water glasses, in toothpastes, in cell phones, or in tunnels, mineral raw materials are the basis for a variety of products and structures and are enormously important.

The Mineral Resources Engineering programme deals with the extraction, treatment, and further processing of mineral raw materials, as well as with tunnel constructions. Mineral raw materials form an essential basis for our modern society and our prosperity. Massive changes are coming in the next decades due to the Green Deal, the energy and mobility transformation. What remains is that the demand for mineral raw materials is steadily increasing worldwide as is the demand for those experts who focus on valuable natural resources.

## WHAT QUALIFICATIONS SHOULD YOU HAVE?

As a future raw materials engineer, you should be willing to ensure the further supply of mineral raw materials and to adapt or develop the necessary technologies to accommodate climate change, land use, species loss, and water scarcity over the next decades. Raw materials engineers are needed around the world, and you should therefore be open to gaining experience abroad. If you are dynamic and enjoy working in an international team and assuming responsibility, you are well equipped for the exciting and manifold tasks of raw materials engineers.

## WHAT CAN YOU EXPECT DURING YOUR COURSE OF STUDY?

The bachelor's programme conveys general technical fundamentals and covers the entire range from mining the raw materials to their processing right up to the production of building materials and ceramic products and tunnel constructions. You will receive a compact education in the following specialised areas
- raw material extraction and surface and subsurface surveying
- geotechnology and tunnel construction
- processing and refinement of mineral raw materials
- manufacturing and use of building materials and ceramics

Afterwards, there are five master's programmes to choose from.

## WHAT CAN YOU EXPECT AFTER YOUR COURSE OF STUDY?

Raw materials engineers manage national or international mining operations; work for ministries; are in-demand tunnel construction specialists; are involved in the production of refractory materials, building materials, glass and ceramics; and refine raw materials to high-tech materials.

### Academic degrees / duration of studies

- BSc / 7 semesters (210 ECTS)
- Dipl.-Ing. / 4 semesters (120 ECTS)
- Dr.mont. / 6 semesters (180 ECTS)

### Bachelor's programme areas of focus

- Raw material extraction
- Underground and tunnel construction
- Surface and subsurface surveying
- Processing and refinement of mineral raw materials
- Development and manufacture of building materials
- Ceramics
- Fire-resistant materials

### Potential master's programmes

- Mining and Tunnelling
- Raw Materials Engineering
- International Master of Science in Advanced Mineral Resources Development
- International Master of Science in Building Materials and Ceramics
- EM Joint Master in Sustainable Mineral and Metal Processing Engineering

### Programme director

Univ.-Prof. Dipl.-Ing. Dr.mont.
Michael Tost

BACHELOR

# GEOENERGY ENGINEERING

ADVANCED RESOURCES

# GEOENERGY ENGINEERING

Fossil fuels largely constitute our energy supply today and can only be replaced over very long time periods. The climate crisis, however, demands quick alternatives. The challenges for future Geoenergy Engineers are therefore extensive. As a result, they are developing innovative technologies and methods for the energetic and sustainable utilisation of the subsurface. This includes "clean", decarbonised fossil fuels, the alternative energy source geothermal energy, and the industrial storage of hydrogen from excess renewable energy. This will make it possible to supply our society with sustainable energy around the clock. And did you know that $CO_2$ can be stored in "empty" oil and gas deposits so that it does not get into the atmosphere at all?

## WHAT QUALIFICATIONS SHOULD YOU HAVE?

In addition to your interest in technology and the sciences, you are enthusiastic about learning about other cultures and would like to have the opportunity to work in an international environment. Because the lectures in the Geoenergy Engineering field of study are held in English, you should enjoy speaking this language and be willing to learn. Does this apply to you? Well, then it is a match!

## WHAT CAN YOU EXPECT DURING YOUR COURSE OF STUDY?

Geoenergy, deep drilling, reservoir simulations...is everything ok so far? No? Do not panic! Before you get involved with all the relevant areas of geoenergy engineering, you will first learn the basics in the first four semesters. So, relax because it is not so bad. Afterwards, you will be busy with searching for and characterising geological deposits (geosciences), the development and simulation of the deposits (reservoir engineering), their exploitation by means of deep drilling (drilling engineering), and the extraction and storage of energy (production engineering). At the end of your bachelor's programme, you not only will be qualified for an advanced master's programme, but also will have a solid basis for entering the energy sector.

In the subsequent master's programme, you can choose a specialisation from a wide selection, depending on what interests you. Here, in the International Study Program in Petroleum Engineering, you can immerse yourself in the individual disciplines (drilling, petroleum production, and reservoir engineering). The Geoenergy Engineering master's programme deals with the energetic utilisation of the subsurface in the broader sense. This includes natural geothermic energy as an energy source and the subsurface as a reservoir for energy and $CO_2$. There are also other master's programmes where you can study both at the Technical University of Leoben and at international universities and earn two degrees.

If you prefer to tackle economic technical challenges, the master's programme in Industrial Management and Business Administration might be exciting for you.

## WHAT CAN YOU EXPECT AFTER YOUR COURSE OF STUDY?

As a graduate of the Geoenergy Engineering course of study, you will be in demand at international companies of the energy industry, at government agencies, and in research and development. You will be trained for working at drilling and mining facilities and can plan production facilities and assess deposits. Pipeline and plant engineering will be part of your expertise. Here, you can join the conventional and alternative energy sectors and can therefore fully contribute to the energy transition.

Language of instruction: English

Academic degrees / duration of studies

- BSc / 7 semesters (210 ECTS)
- Dipl.-Ing. / 4 semesters (120 ECTS)
- Dr.mont. / 6 semesters (180 ECTS)

Bachelor's programme areas of focus

- Sustainable energetic utilisation of the subsurface
- Extraction and transport of fluid raw materials/energy sources
- Production of geothermic energy
- Geological energy storage and decarbonisation in the energy sector

Potential master's programmes

- Geoenergy Engineering
- International Study Program in Petroleum Engineering
- Industrial Management and Business Administration
- Joint International Master Program in Petroleum Engineering

Programme director

Univ.-Prof. Dipl.-Phys. Dr. rer. nat. Holger Ott

BACHELOR

# ENERGY TECHNOLOGY

ADVANCED RESOURCES

# ENERGY TECHNOLOGY

Have you charged your cell phone battery, turned up the heat in your house, or driven your car today? These are daily activities that require different types of energy, but how are these supplied, transported, and utilised? A question that is becoming more and more important due to the increasing energy demand worldwide and its effect on our climate. Whether in the household, in mobility, or in industrial production processes, we need a high amount of fossil-based and renewable energy.

In the energy system of the future, electrical, mechanical, or thermal energy must be supplied, transported, and utilised in a more climate- and ecofriendly way and more efficiently. Therefore, it is especially important that interested and responsible students address the problem of the future supply of energy within the framework of an Energy Engineering course of study. After all, only by developing innovative technologies with the increased utilisation of renewable energy sources can the resources of our planet be sustainably and efficiently utilised. At the same time, the energy supply will be ensured for future generations this way.

Are you ready to take on new challenges and develop the energy system of the future? Do you have innovative ideas and are you interested in new technologies? Then, the Energy Engineering field of study is right for you!

## WHAT QUALIFICATIONS SHOULD YOU HAVE?

With the increasing demand for energy on the one hand and dwindling raw materials and climate change on the other, as an energy engineer, you will be taking on complex challenges. Your objective is to find efficient, ecofriendly, and climate-friendly solutions for the supply, transport, conversion, and utilisation of energy. Because the course of study includes many different technical disciplines, you should have a wide range of interests. If it is easy for you to approach a problem strategically, and to think systematically and innovatively and if you enjoy tackling problems in a team, this course of study will offer you excellent future perspectives.

## WHAT CAN YOU EXPECT DURING YOUR COURSE OF STUDY?

In the bachelor's programme, you will acquire basic knowledge for a technical course of study and will deal with problems from energy system technology, process technology and engineering, and power plant technology. How do I plan a power plant and optimally operate it? Is it possible to simulate a combustion process? What solutions are there for climate-neutral mobility? How do I develop a regional energy concept for the utilisation of renewable energy sources? What effects does the energy revolution have on our energy networks? What technical, legal, and economic frameworks are necessary to design our energy system to be climate-neutral?

Economic understanding plays a major role for energy engineers. Therefore, this course of study also covers the areas of energy management, energy markets, and energy law. In the master's programme, you will deepen your knowledge in the specialised areas of energy supply, energy utilisation, energy process technology, and energy management. A strong focus is put on the digitalisation of arising challenges and opportunities here.

In the master's programme, you can deepen your knowledge about energy engineering.

## WHAT CAN YOU EXPECT AFTER YOUR COURSE OF STUDY?

There is a high demand for our Energy Engineering graduates worldwide in industry and at energy providers. This course of study will prepare you for a diversified field of activity in research and management. The fields of activity include energy supply, particularly regarding the challenges in using renewable energy sources; development of innovative energy technologies; process optimisation and energy efficiency in industry; design, planning, and operation of energy grids; engineering and plant construction; energy management; and supply optimisation.

### Academic degrees / duration of studies

- BSc / 7 semesters (210 ECTS)
- Dipl.-Ing. / 4 semesters (120 ECTS)
- Dr.mont. / 6 semesters (180 ECTS)

### Bachelor's programme areas of focus

- Sustainability
- Energy provision
- Energy efficiency

### Potential master's programmes

- Energy Engineering

### Programme director

Univ.-Prof. Dipl.-Ing. Dr. techn.
Thomas Kienberger

BACHELOR

# METALLURGY AND METAL RECYCLING

SUSTAINABLE PROCESSING

# METALLURGY AND METAL RECYCLING

Metallic materials are indispensable for global development in mobility, energy extraction, electronics, communication, and medicine. Metallurgy involves the technologies for sustainably extracting and processing metals. The metal cycle goes from the raw material to the reusable material, to the material, and to the product. At the end of the life cycle, the metal is returned to its raw material state. Only completing the cycle will make us independent of raw material and energy imports and will make it possible to achieve the climate goals of the EU. Never has the world of metallurgy changed so dynamically, and you can be part of this!

The Metallurgy and Metal Cycles course of study is only offered at the Technical University of Leoben in Austria. Metallurgists have a versatile working environment, whether in production, development, research, technical sales, or plant construction, our graduates are in high demand as managing directors both at home and abroad!

## WHAT QUALIFICATIONS SHOULD YOU HAVE?

Do you have a basic interest in science and technology and enjoy interdisciplinary and independent thinking? Are you open-minded and creative? Are you enthusiastic about developing and implementing new solutions and making processes and products more economical and ecological? Then you are in the right place!

## DURING YOUR STUDIES: WHAT TO LOOK FORWARD TO?

Following the uniform first academic year for all fields of study, there will be in-depth instruction in metallurgical process technology and the basics of materials and production technology. Starting from the first semester, you will learn how to perform experiments independently in the laboratory ("Do-it Labs"). Your digital expertise will be supported by the practical conveying of programming skills to solve metallurgical problems.

Instruction in metallurgy, materials science, and production technology accompanies the entire metal cycle from the extraction of metals from primary and secondary raw materials (climate-neutral, new technologies are paramount here) to process and production technology, particularly taking digitalisation into consideration, right up to materials technology to meet the ever-increasing quality demands on metallic products.

A wide range of business administration courses in combination with the basics of labour, social, and environmental law round out the educational training. Lecturers from business will supplement the theoretical knowledge with their experience.

Foreign language lectures should prepare you for semesters and work placements abroad, and you will also have the opportunity to try out and improve your own language skills through "learning by doing" in the "Do-it Labs". From the entire educational programme, you will choose one subject for your bachelor's thesis – your first independent scientific paper, which also completes your bachelor's programme.

In the master's programme, you can focus on metallurgy and the international master's programme of Sustainable Materials, but you are generally approved for all master's programmes at the Technical University of Leoben (possibly subject to certain conditions).

## WHAT CAN YOU EXPECT AFTER YOUR COURSE OF STUDY?

After completing the Metallurgy and Metal Cycles bachelor's programme, you will be able to take on management positions in relevant sectors of metal production, metal processing, plant construction, and supply industry. The activities range from research and development, managing companies, and planning and international commissioning of new systems to technical sales.

### Academic degrees / duration of studies

- BSc / 7 semesters (210 ECTS)
- Dipl.-Ing. / 4 semesters (120 ECTS)
- Dr.mont. / 6 semesters (180 ECTS)

### Bachelor's programme areas of focus

- Production processes of metal manufacturing and processing
- Circular economy
- Recycling of metals
- Production technology
- Materials science for metals
- Industrial economy

### Potential master's programmes

- Metallurgy and Metal Recycling
- International Master in Sustainable Materials

### Programme director

Univ.-Prof. Dipl.-Ing. Dr.mont.
Helmut Antrekowitsch

BACHELOR

# INDUSTRIAL LOGISTICS

SUSTAINABLE PROCESSING

# INDUSTRIAL LOGISTICS

Logistics combines functions to form process chains and companies to form value-added networks. Future challenges lie in the rising complexity and speed of international business operations. In our globalised world, products, services, and information arise, often on different continents and must nevertheless come together and be merged down to the exact minute.

Industrial logisticians are responsible for providing the right products at the right time, at the right place, in the right quality, and in the right amounts, and it is the customer who decides what is "right". "Just in time" means that parts from the supplier companies are delivered directly to the assembly line only once they are needed with the time calculated as exactly as possible, thereby cutting costs. Logistics is of particular importance to a company's success because it establishes the connections among procurement, production, and consumers.

## WHAT QUALIFICATIONS SHOULD YOU HAVE?

How do goods, information, and energy move through the world? What should the ideal production sequence look like in a company? How can online merchants deliver goods within 24 hours? Having a general interest in business and technical processes, as well as in the area of communication and information technology, is an important requirement for a successful course of study. Future industrial logisticians should enjoy working in a team and on projects.

## WHAT CAN YOU EXPECT DURING YOUR COURSE OF STUDY?

During the bachelor's programme, you will learn the basics of science and technology and will focus on logistics and process management, business administration, and information technology.

You will learn how to describe economic systems as flows of objects (such as goods, people, energy, and information) in networks, assess them, and optimise them. Process and project management is an important part of your training as is the development of management systems, e.g., to ensure the quality, occupational health, and safety or compliance with environmental requirements in a company. To do this, it is also important to understand technical logistics systems, e.g., in order to assess the use of automation. As a future industrial logistician, you will also learn how IT systems are planned and used for supporting logistical processes.

In the four-semester master's programme, you can deepen your knowledge in two of four different specialisations: Logistics Systems Engineering, Logistics Management, Computational Optimisation, and Automation.

## WHAT CAN YOU EXPECT AFTER YOUR COURSE OF STUDY?

As an industrial logistician with good technical and business expertise, you will be equipped for market challenges. Fields of activity include materials management, supply chain planning and control, industrial purchasing, organisation and process management, information technology, and disposal. The relevant sectors include, e.g., heavy industry, raw materials industry, electronics industry, and logistics service providers. Other application areas are companies that provide solutions for warehouse automation, transport, and conveying technology, as well as container management.

### Academic degrees / duration of studies

- BSc / 7 semesters (210 ECTS)
- Dipl.-Ing. / 4 semesters (120 ECTS)
- Dr.mont. / 6 semesters (180 ECTS)

### Bachelor's programme areas of focus

- Logistics systems engineering
- Logistics management
- Warehouse planning
- Material flow management
- Production planning and control
- Process management
- Optimisation of logistics systems

### Potential master's programmes

- Industrial Logistics
- Industrial Data Science

### Programme director

Univ.-Prof. Mag. Dr.
Helmut Zsifkovits

BACHELOR

# INDUSTRIAL DATA SCIENCE

SUSTAINABLE PROCESSING

# INDUSTRIAL DATA SCIENCE

Do you want to see what is behind the key words "Big Data" and "Artificial Intelligence"? Do you want to know how companies make optimised decisions by means of intelligent data analysis? Do you want to help make sure that technical processes can run efficiently while conserving resources?

Data is the "new gold", and data scientists are urgently needed in all areas of business and industry. Digitalisation is not only permeating our daily lives, but also changing production processes in companies. The availability of sensors, computer power, and networks, made possible by the fusion of production and information technologies, allows for the implementation of ideas, products, and business models that would have been impossible just a few years ago.

The competitiveness of companies strongly depends on their ability to generate business and social benefits from digitalisation and data science projects. To implement data science in the technical area and in productive industry, the ability to apply data science methods and an understanding of the respective technical processes are necessary.

## WHAT QUALIFICATIONS SHOULD YOU HAVE?

Data Science is a multifaceted discipline, where both hard skills and soft skills are in demand. As a data scientist, you are excited by the opportunities of information technology and a future with artificial intelligence or machine learning. You make use of your good communication skills to coordinate the different areas of an organisation as a human interface. The courses in Leoben feature a special technical orientation, which is why enjoying technical processes is an advantage.

As a data scientist, you consider processes holistically, and, as a member of a team, you try to control and improve these processes by acquiring, processing, and analysing data.

## WHAT CAN YOU EXPECT DURING YOUR COURSE OF STUDY?

In addition to basic technical/scientific knowledge, during your bachelor's programme, you will acquire the ability to process data science problems comprehensively. In addition, you will deal with sensors, networks, cloud services, machine learning, simulation, and automation, as well as business and economic aspects. A detailed introduction to technical processes will open new perspectives for data science applications in industry.

In project work, you will implement your skills in a team from data acquisition and analysis to software creation right up to industrial applications.

## WHAT CAN YOU EXPECT AFTER YOUR COURSE OF STUDY?

Industry has an insatiable demand for data scientists, particularly those who have technical training. Therefore, our comprehensively educated, interdisciplinary graduates have a wide range of fields of work open to them, depending on their interests, such as the development of data mining and machine learning projects, particularly in the technical area; data- and model-driven analysis and improvement of technical processes; development of new business models through digitalisation; supporting decision makers by preparing, analysing, and visualising big data; and consulting and services in the data science area.

### Academic degreed / duration of studies

- BSc / 7 semesters (210 ECTS)
- Dipl.-Ing. / 4 semesters (120 ECTS)
- Dr.mont. / 6 semesters (180 ECTS)

### Bachelor's programme areas of focus

- Basic technical/scientific education
- Focused information technology topics
- Data science with analytical
- AI methods

### Potential master's programmes

- Industrial Data Science
- Industrial Logistics
- Industrial Management and Business Administration
- Energy Engineering
- International Master in Sustainable Materials
- Responsible Consumption and Production
- Circular Engineering

### Programme director

Univ.-Prof. Dipl.-Ing. Dr.
Peter Auer

BACHELOR

# ENVIRONMENTAL AND CLIMATE PROTECTION TECHNOLOGY

SUSTAINABLE PROCESSING

# ENVIRONMENTAL AND CLIMATE PROTECTION TECHNOLOGY

Manufacturing everyday products for human use always has effects on the climate and environment. Meanwhile, these effects can also be clearly felt on our planet, such as climate change and the greenhouse effect, pollution of rivers and oceans by waste water and chemicals, fine dust in the air, and industrial accidents, often with damage that is difficult to eliminate.

The great social challenges in the areas of resources, climate, energy, and environment require technical solutions. Engineers deal every day with how to prevent industrial production from affecting the climate, environment, and human life. The bachelor's programme forms the basis for developing climate- and ecofriendly technical processes and climate-neutral product design.

## WHAT QUALIFICATIONS SHOULD YOU HAVE?

If you are interested in natural and technical processes, are curious about how technical processes work, and would like to help solve climate and environmental problems, then you already meet the most important requirements. At the same time, you should also be able to utilise and combine your acquired detailed knowledge in an interdisciplinary way. If you also have the creativity to solve complex problems and have some manual skills for the lab and technology, the Environmental and Climate Protection Technology course of study is right for you.

## WHAT CAN YOU EXPECT DURING YOUR COURSE OF STUDY?

Environmental and climate protection engineers require everyday knowledge and skills from different areas of expertise from chemistry, mechanical engineering, and mathematics to environmental law, toxicology, and business administration right up to performing lab analyses and computer simulations. This area has it all. These basic principles, which you will mainly learn in the bachelor's programme, form the basis for further specialisations in the master's programme. There, you can focus on climate protection technology and process engineering or on environmental and waste technology. In climate protection technology and process engineering, you will also deal with the development of systems to separate and recover greenhouse gases, treatment of pollutants, exhaust emissions, waste water, and waste that arises as emissions during product manufacturing. To do this, you must understand the production processes and be familiar with the possible effects of these emissions on the environment and climate.

Environment and waste technology mainly deal with the residual materials and waste that arise and avoiding, sensibly recovering, and disposing of them properly. Here, cycles can be closed by extracting a raw material from the waste of one industrial branch for use in another. In addition, consideration is already being given to the kind of waste that will have to be dealt with in the future and how it can be treated.

## WHAT CAN YOU EXPECT AFTER YOUR COURSE OF STUDY?

Environmental and Climate Protection Technology plays a role in practically all areas of business and industry, which is why you can gain a foothold in a wide variety of industrial sectors, such as in the paper, cement, petroleum, food, iron, and steel industries, and power plant technology or environmental technology itself (waste water, exhaust air purification, renewable energies and raw materials, consultation in envirotechnical areas, environmental authorities, etc.).
Due to the broad base of this course of study, you have the advantage of being able to decide where you want to go, depending on your own personal interests.

### Academic degrees / duration of studies

- BSc / 7 semesters (210 ECTS)
- Dipl.-Ing. / 4 semesters (120 ECTS)
- Dr.mont. / 6 semesters (180 ECTS)

### Bachelor's programme areas of focus

- Climate protection technology and process engineering
- Environmental and waste engineering

### Potential master's programmes

- Environmental and Climate Protection Technology
- Energy Engineering

### Programme director

Prof. Dipl.-Ing. Dr.mont.
Roland Pomberger

BACHELOR

# RECYCLING

SUSTAINABLE PROCESSING

# RECYCLING

Recycling is the discipline of the future for securing raw materials, combating climate change, and protecting the environment. Globally, the amount of recycling materials and the use of secondary raw materials in various compositions is constantly on the rise. The recycling economy must therefore overcome many challenges and is therefore subject to constant change.

Waste, recyclable materials, and scrap (scrap cars, electronic scrap, cell phones, photovoltaic systems, etc.) must evolve more into valuable secondary raw materials in the coming years to guarantee sustainable production and competitiveness for the future.

Recycling is becoming more and more important, and the entire cycle from product design to the use of intelligent collection systems and processing right up to material/energy reuse must be taken into consideration. The global creation of recycling networks and centres furthermore shows the global dimension of this development, where there is an extremely high demand for recycling engineers with comprehensive skills.

## WHAT QUALIFICATIONS SHOULD YOU HAVE?

Recycling includes the entire product life cycle, so comprehensive thinking and the enjoyment of technical processes are certainly advantageous. In this programme, you will learn to network, plan, accompany, and control recycling processes with different disciplines. In addition to technical and economical/legal expertise, systematic thinking and communication skills are also required. Yesterday still garbage and today valuable raw material – a discipline with enormous development potential.

## WHAT CAN YOU EXPECT DURING YOUR COURSE OF STUDY?

In the bachelor's programme, you will acquire the basic knowledge for a technical course of study and will deal with the problems of the waste economy, process engineering, metal and plastic recycling, and the fundamentals of materials science. In addition, economic and legal aspects will play a major role.

In the master's programme, your knowledge will be deepened, whereby the focus will especially be on the waste economy, processing of secondary raw materials, metal recycling, and recycling-compatible product design. In business-related lectures, you will acquire the necessary management skills. Likewise, you will become familiar with the legal constraints of recycling.

## WHAT CAN YOU EXPECT AFTER YOUR COURSE OF STUDY?

Recycling technology is an enormously growing market, which will only become more important as the years go on. With this course of study, you will acquire the comprehensive technical, economical, and legal knowledge for solving complex recycling problems. Thanks to the networked, interdisciplinary education, recycling engineers have excellent career opportunities. The fields of activity include, among other things,
- disposal and collection logistics,
- material and thermal reuse of secondary materials (metals, plastics, building materials, glass, paper, etc.),
- as well as the associated plant engineering,
- recycling in the metal- and plastic-creating and processing industries,
- recyclable material, product development in the production industry, and
- consultation and services in the area of recycling.

### Academic degrees / duration of studies

- BSc / 7 semesters (210 ECTS)
- Dipl.-Ing. / 4 semesters (120 ECTS)
- Dr.mont. / 6 semesters (180 ECTS)

### Bachelor's programme areas of focus

- Raw materials and metal recycling
- Process and waste engineering
- Metallurgy
- Polymer engineering
- And waste law

### Potential master's programmes

- Recycling

### Programme director

Univ.-Prof. Dipl.-Ing. Dr.
Helmut Antrekowitsch

BACHELOR

# CIRCULAR ENGINEERING

RESPONSIBLE CONSUMPTION AND PRODUCTION

# CIRCULAR ENGINEERING

Would you like to help find solutions to global challenges? Then you are in the right place with Circular Engineering. You will become part of a new generation of engineers, who will critically analyse technological processes and redesign these to complete material cycles, increase efficiency, and, at the same time, minimise the ecological footprint.

With this interdisciplinary education, graduates of the Circular Engineering programme will become highly competent decision makers in industry, business, and society.

## WHAT QUALIFICATIONS SHOULD YOU HAVE?

You are curious, creative, and enthusiastic about redesigning technical processes. You want to understand the relationships between these processes and their effects on the environment. You enjoy working with different materials and would like to use these creatively and sustainably. You would also like to find new ways of extracting and using raw materials in a sustainable way.

## WHAT CAN YOU EXPECT DURING YOUR COURSE OF STUDY?

In this bachelor's programme conducted in English, you will acquire tools in theory and practice from the areas of technology, science, sustainability, and economy.

You will learn to understand the laws of nature and the interdependencies according to which our world works. You will gain an understanding for how production systems and material flow systems work and how sustainability can succeed. As a future Circular Engineer, it is important to combine and apply these skills in order to approach challenges and global developments from different perspectives and develop innovative solutions. This way, you will contribute towards a sustainable circular economy.

## WHAT CAN YOU EXPECT AFTER YOUR COURSE OF STUDY?

You are proficient in the concept of circularity of material flows, particularly on the production side, from primary raw materials and production systems to the product right up to the manufacturing of quality-assured secondary raw materials by means of well-engineered recycling methods. This way, you will contribute towards designing and implementing processes along the material flow from raw material extraction to recycling, in an energy- and resource-efficient manner, while minimizing the ecological footprint.

After your Circular Engineering course of study, a wide range of tasks will be waiting for you in the area of the development of new technologies, products, and materials; the development of energy sources and raw materials; and the development of environmentally and socially acceptable value-added systems – everywhere, where sustainable decisions are to be made.

Where? Everywhere in Austria, Europe, and the entire world and, who knows, maybe even somewhere else in our universe. As a Circular Engineer, you will be a mainstay in companies, in science, and for political decision makers.

Here, you will play a decisive role in the transition of technological processes towards a circular economy: "Future Circular Engineers – Engineer the Future".

Language of instruction: English

Academic degrees / duration of studies

- BSc / 7 semesters (210 ECTS)
- Dipl.-Ing. / 4 semesters (120 ECTS)
- Dr.mont. / 6 semesters (180 ECTS)

Bachelor's programme areas of focus

- Sustainable development
- Primary raw materials
- Secondary raw materials and recycling
- Process engineering
- Materials

Potential master's programmes

- Circular Engineering
- Responsible Consumption and Production

Programme director

Univ.-Prof. Dipl.-Ing. Dr.mont. Clemens Holzer

BACHELOR

# RESPONSIBLE CONSUMPTION AND PRODUCTION

# RESPONSIBLE CONSUMPTION AND PRODUCTION (EURECA-PRO)

You try to separate your waste, use public transportation or your bicycle and you are economical in your use of water and resources, but is that enough? Do you ask yourself where all these things around us come from and whether we even need them? How can an economic system work without growth? Do you care about the environment and would you like to know how you can contribute?

With in-depth knowledge of technology and management, you will become a professional in the area of responsible production and consumption and will make the world a little better with your know-how.

Your unique educational journey begins with the bachelor's programme called Responsible Consumption and Production within the European University on Responsible Consumption and Production (EURECA-PRO). You will become part of a community made up of eight European universities and will have the opportunity to get to know different countries, languages, and universities with different areas of focus.

## WHAT QUALIFICATIONS SHOULD YOU HAVE?

You are interested in technology and want to learn about production processes and consumer behaviour. You would like to travel around Europe, become familiar with new cultures and languages, and build up a unique network. This course of study is for people with a vision, for whom the diversified and complex topic of sustainability is an incentive to acquire interdisciplinary knowledge.

## WHAT CAN YOU EXPECT DURING YOUR COURSE OF STUDY?

We educate generalists with a vision. During your studies, you will acquire sound and extensive knowledge and expertise in the areas of production and consumption. We will begin with teaching basic knowledge in engineering and will develop business expertise on the topic of sustainable development. Based on this foundation, you can spend one or more semesters at one of our eight partner universities throughout Europe.

In a work placement, you will distinguish yourself as an engineer with a holistic perspective of Responsible Consumption and Production with excellent English skills and gain valuable experience.

Building on your bachelor's programme, we offer a master's programme, which puts an in-depth focus on the technical, economical, and social aspects of the circular economy.

## WHAT CAN YOU EXPECT AFTER YOUR COURSE OF STUDY?

A diversified range of potential jobs will be open to you as a consultant with a vision and interdisciplinary knowledge in technology and business for companies in all sectors from mining to industry right up to service providers, NGOs, and political bodies. You are well-versed in technology and business and will bring a broad European network along with you to the job. You will see that you and your colleagues will contribute to gradually making the world a better place.

Language of instruction: English

Academic degrees / duration of studies

- BSc / 8 semesters (210 ECTS)
- Dipl.-Ing. / 4 semesters (120 ECTS)
- Dr.mont. / 6 semesters (180 ECTS)

Bachelor's programme areas of focus

- Sustainable development
- Primary raw materials
- Secondary raw materials and recycling
- Process engineering
- Materials

Potential master's programmes

- Responsible Consumption and Production (EURECA-PRO)
- Joint Master's Programme in Responsible Consumption and Production (EURECA-PRO)
- Circular Engineering

Programme director

Univ.-Prof. Dipl.-Ing. Dr.mont. Clemens Holzer

BACHELOR

# MATERIALS SCIENCE AND TECHNOLOGY

SMART MATERIALS

# MATERIALS SCIENCE AND TECHNOLOGY

Efficient aircraft turbines, dirt-repellent sport shoes, foldable displays, or biocompatible implants in medicine – innovative products can only be realised with the help of modern materials. As a materials scientist, you will be very familiar with the characteristics of metallic, ceramic, polymeric, and functional materials. Whether the service life of products is to be increased or the energy efficiency improved, you will have a deep understanding of the atomic structure of these materials and what this means for their processing as well as functional and mechanical behaviour. With your knowledge of materials science and technology, you will find a way to solve the challenges of the future.

It is no wonder that the innovation and development of materials go hand in hand. Intelligent, new materials ensure the reduction of traffic emissions, drive electromobility forward, and also counteract climate change.

New materials are frequently inspired by nature: In order to make materials stronger and more damage-tolerant, researchers in Leoben have developed new structures based on wood, bone, or seashells. To create these structures, state-of-the-art processing methods such as additive manufacturing (3D printing) can be employed. This also offers the possibility to fabricate smart products, which can adapt their properties and structures to external stimuli (for instance electricity, temperature, or light).

## WHAT QUALIFICATIONS SHOULD YOU BRING?

Do you enjoy being inspired by nature? Do you enjoy solving problems? Are you interested in technology? Then you hold already very good qualities to become a scientist. If you also bring along a good dose of curiosity and creativity and have an exploratory spirit, you are well situated in the materials science and technology programme! So, are you ready to dive into the world of materials?

## WHAT CAN YOU EXPECT DURING YOUR STUDIES?

Before you dive into the world of materials, you will first learn the basics during the first four semesters. Different materials, such as metals, ceramics, and plastics, will be examined more closely during your studies, in both materials technology and materials testing. In the "Do-it Labs", you can apply your newly acquired knowledge and learn how to develop technical materials science-related solutions to solve upcoming challenges.

Depending on your interests, you can either immerse yourself in the atomic level of materials or explore the world of polymer engineering across the entire process chain from raw materials to processing up to the final product. After completing your bachelor's programme, you can choose from three possible master's degree programmes.

## WHAT CAN YOU EXPECT AFTER YOUR STUDIES?

As a Leoben graduate, you will develop and realise materials or products for the challenges of tomorrow. Whether energy-saving materials for the automotive industry or aerospace, pollutant-free energy conversion and storage, flexible electronics and 5G communication technology, or 3D-printed bioimplants, there are no limits to your research drive and pioneering spirit!

### Academic degrees / duration of studies

- BSc / 7 semesters (210 ECTS)
- Dipl.-Ing. / 4 semesters (120 ECTS)
- Dr.mont. / 6 semesters (180 ECTS)

### Bachelor's programme areas of focus

- Metals
- Ceramic products and functional materials
- Dynthetic materials and plastics
- Materials engineering
- Materials testing

### Potential master's programmes

- Materials Science
- Polymer Engineering and Science
- Advanced Materials Science and Engineering (AMASE)

### Programme director

Univ.-Prof. Dr.
Raul Bermejo Moratinos

BACHELOR

# MECHANICAL ENGINEERING

SUSTAINABLE PROCESSING

# MECHANICAL ENGINEERING

The field of activity for mechanical engineers is extremely diverse. It includes research and development, construction, automation, production, sales and marketing, and servicing of machines and systems.

The high degree of materials know-how is a specific feature of Leoben mechanical engineers. Creativity and innovation are what drive mechanical engineering. How about a fish as a model for aerodynamic electric vehicles? The generation of green energy with modern wind turbines? Components that reduce emissions thanks to their design? And how do you print complex 3D parts from metal powder in a short time with a laser-based system for additive production?

The sky is the limit for your ideas. From planning and design to the correct selection of materials right up to production, the development and implementation are up to you as the decision maker.

## WHAT QUALIFICATIONS SHOULD YOU HAVE?

Mechanical engineering combines a wide variety of engineering fields under one roof. That's why, in addition to an interest in technology, natural sciences and a logical-analytical way of thinking, you should also bring along a portion of creativity, inventiveness and curiosity. The interdisciplinary nature of mechanical engineering requires efficient communication with other departments at home and abroad, along with the ability to work in a team. Today, digitalisation is indispensable in the most diverse areas of mechanical engineering, making enthusiasm for computers essential.

## WHAT CAN YOU EXPECT DURING YOUR COURSE OF STUDY?

The basic instruction during the first four semesters forms the basis of your mechanical engineering studies. Afterwards, you will begin to use your technical, analytical, and creative skills to deal with ideas, drafts, designs, and constructions. For this purpose, basic knowledge in the areas of development, construction, automation, digitalisation, mechatronics, and materials and production technology will be conveyed to you.

You can strengthen your teamwork skills by working together with other students at the Technical University of Leoben to solve socially relevant problems. This includes, for example, the development of sustainable drive concepts for the mobility sector or the planning of machines for the extraction and processing of raw materials right up to their use as high-tech materials. Digitalisation and mechanical engineering naturally go hand in hand; therefore, to be able to develop efficient machines, the simulation and digitalisation of processes to optimise their interaction is part of your instruction. Taking the principle of sustainability and circular economy aspects into account, you will specialise your expertise in the subsequent master's programme not only theoretically and scientifically, but also practically. You will learn how to realise engineering tasks innovatively, optimally regarding function and cost, and, at the same time, also sustainably.

The subsequent master's programme will focus on development and construction, production technology, mechatronics, and heavy machinery construction.

## WHAT CAN YOU EXPECT AFTER YOUR COURSE OF STUDY?

Realise your ideas as a development, production, or plant engineer. Your area of work is not only limited to machines but ranges from individual mechanical, mechatronic, and electrical devices right up to complex systems. Of course, in addition to new developments, you will also deal with further developing or increasing the efficiency of existing machines and systems. After your Mechanical Engineering studies, the sky is the limit!

### Academic degrees / duration of studies

- BSc / 7 semesters (210 ECTS)
- Dipl.-Ing. / 4 semesters (120 ECTS)
- Dr.mont. / 6 semesters (180 ECTS)

### Bachelor's programme areas of focus

- Development
- Construction
- Automation
- Digitalisation
- Mechatronics
- Materials
- Production technology

### Potential master's programmes

- Mecanical Engineering

### Programme director

Univ.-Prof. Dipl.-Ing. Dr. techn. Martin Stockinger


# YOUR CAMPUS OF THE FUTURE

## DISCOVER THE FUTURE

Have we made you curious? Good! We cannot wait to see you on campus. If you would like to know more about us, our current research projects, everyday life at the university, or the campus, here are a few QR codes for you to scan and discover.


## MYSTERY

Discover new projects from research, contests, competitions, and much more.

## NEWS

Current topics from science, research, and everyday life at the university and on campus.

## IMAGE

Moving mountains.
Are you ready for the adventure?

## INTERNATIONAL

All the information about studying abroad with Technical University of Leoben.

# SERVICES

## STUDY SUPPORT CENTER (SSC)

The SSC serves all student interests, students, teachers, and employees in issues relating to courses of study as a central point of contact. The SSC provides information from the beginning to the end of one's studies, takes care of all programme and central testing administration, accompanies the course planning, and supports the current further development of modern, digital communication and administration procedures.

ssc.unileoben.ac.at
ssc@unileoben.ac.at

## ADVISING FOR PROSPECTIVE STUDENTS

Technical University of Leoben offers a range of opportunities to all prospective students so that they can thoroughly inform themselves about studying in Leoben: information days, online advising, or at your school on request.

unileoben.ac.at/starter
info@unileoben.ac.at

## AUSTRIAN NATIONAL UNION (ÖH)

**The federal representative of the Austrian Student Union is the legal advocate of Austrian students. The Austrian Student Union Leoben (ÖH Leoben) provides valuable tips concerning topics on the start of studies and student life in Leoben. Each semester, a contribution of 22.70 euros is to be paid to the Austrian Student Union (last updated: 2023/2024 academic year).**

**oeh-leoben.at**
**vorsitz@oeh.unileoben.ac.at**

## UNIVERSITY LIBRARY LEOBEN

Leoben's University Library consists of the main library and specialised libraries at the different organisation units. Trained information assistants help the students with literature searches and library use.

bibliothek.unileoben.ac.at
univbibl@unileoben.ac.at

## CANTEEN

Students can go to the university canteen and eat for an affordable price or can meet friends during breaks at the modern "Erzherzog Johann Trakt".

mensen.at

## MONTANUNIVERSITÄT INTERNATIONAL RELATIONS OFFICE (MIRO)

There are agreements with several universities in Europe and around the world, which allow students to spend one to two semesters abroad. The International Relations Office supports and advises all students who would like to study abroad.

international.unileoben.ac.at
outgoing@unileoben.ac.at

## UNIVERSITY SPORT LEOBEN (USI)

To balance your studies, the USI Leoben offers a wide range of sports courses and seminars at extremely affordable rates. This is a great opportunity for first-year students not only to try out innovative types of sports, but also to establish social contacts.

usi.unileoben.ac.at
usi@unileoben.ac.at

## CENTRE FOR LANGUAGES, EDUCATION AND CULTURE

The diversified course offerings allow students to learn various foreign languages in addition to pursuing their studies. The programme is enhanced by cultural events and training in the area of social skills.

zsbk.unileoben.ac.at
zsbk@unileoben.ac.at

## ALUMNI CLUB

Graduates of Technical University of Leoben perceive themselves as a globally active network, which has close ties to its alma mater and allows fellow students to remain in contact and expand their network. Companies are also part of this club.

alumni.unileoben.ac.at
alumni@unileoben.ac.at

## DELTA ACADEMY

The Delta Academy is a programme at Technical University of Leoben for the promotion of junior executives. It is a valuable parallel elective for selected students of Montanuniversität Leoben.

deltaakademie.unileoben.ac.at
deltaakademie@unileoben.ac.at

## ONLINE

On our platforms, you will learn more about exciting projects and what is new in our current research, everyday life at the university, and life on campus. Take a look!

facebook.com/MULeoben
instagram.com/montanunileoben

youtube.com/
@MontanuniversitatLeoben

commULity

commulity.unileoben.ac.at

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