39th Conference of

Rectors and Presidents of European Universities of Technology

Universities of Technology addressing the challenges that planet earth is facing

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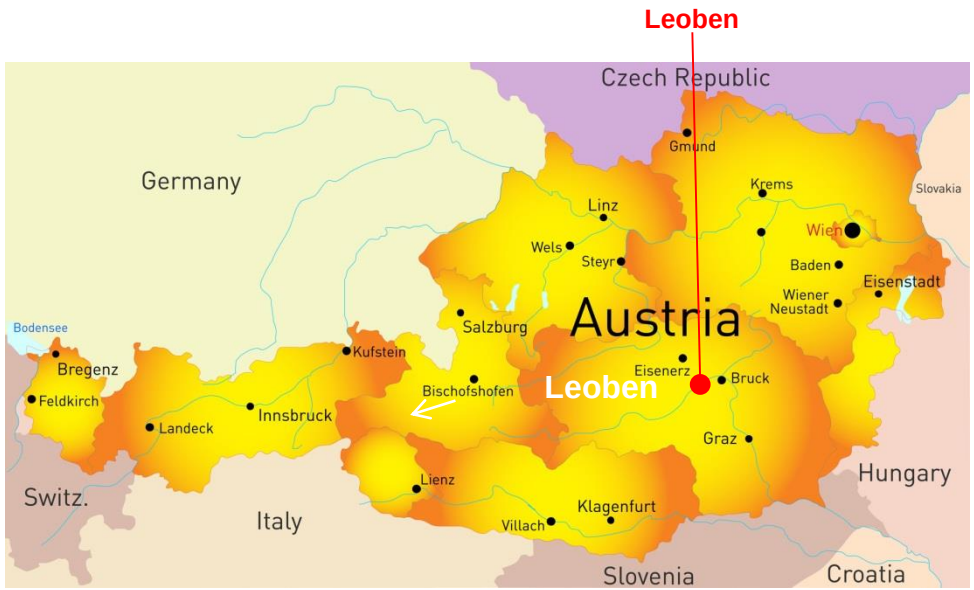
Content

Location & History



- **1840** founded as „Styrian Corporate School of Mining & Metallurgy“
- **1904** doctoral degree programmes introduced, renamed as „University of Mining and Metallurgy“
- Since **1955:** new degree programmes added
- **2014** Study programme „Recycling Technology“ closes raw materials cycle

Montanuniversitaet Leoben – students and staff

- Appr. **3,800** students,
  > **400** doctoral students
- **24 %** female students
- **19 %** international students,
  from 80 nations
- **53** professors / chairs
- **1300** employees

Content

Challenges

From a University of Resources & Materials point of view:

- population growth
- economic development
- climate change
- increase in resources & energy demand
- etc.

Demand on

- new technologies,

but we also need

- change of consumer‘s behaviour: responsible consumption

Content

Situation at the TU's

Significant decline of students

Significant and ongoing decline in student numbers; declining student numbers lead to lack of in-house research talent:

- Demographic development
- Decline in STEM interest
- Apparent lack of attractiveness of the range of studies offered
- Difficult studies? Poor preparation by schools?
- Technology is seen as a problem maker, not a problem solver

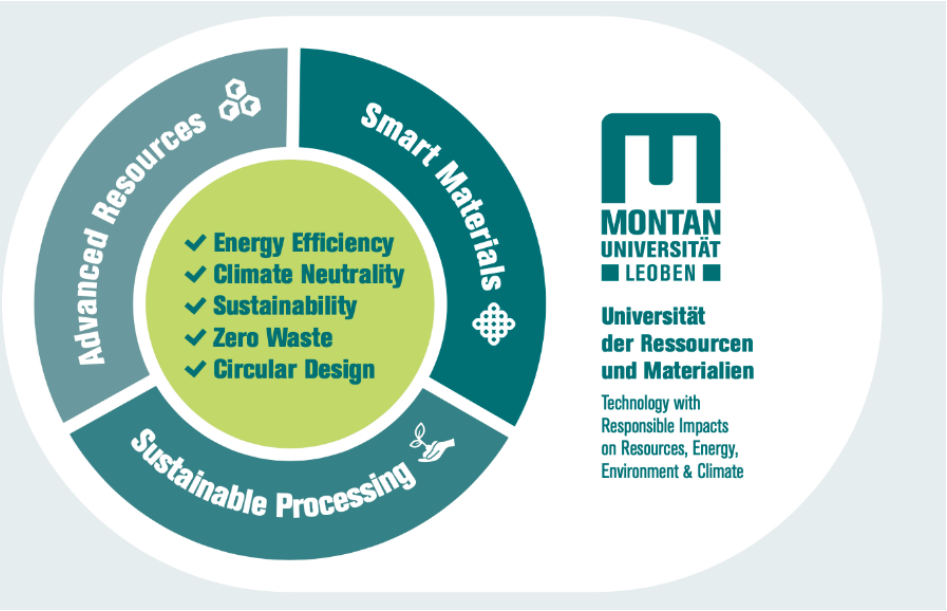
Demands from society and politics

- **Need** for more academically trained employees and desire for better education, higher income and reputation (academisation of society)
- **Opening up** of universities and higher education, cooperation with companies and institutions

Content

Positioning

Fundamental repositioning



Key messages

- The major societal challenges in the areas of resource scarcity, climate, energy and the environment must be met predominantly with technical and scientific methods.
- The Montanuniversität Leoben sees its task in making significant contributions to this through excellent science and outstanding education.
- Our actions are aligned with five core values that form the "DNA" of our offerings and guide all our actions

Study architecture 2021

Bachelor studies

- Applied Geosciences
- Mineral Resources Engineering
- Petroleum Engineering
- Materials Science
- Polymer Engineering and Science
- Metallurgy
- Mechanical Engineering
- Industrial Environmental Protection and Process Technology
- Recycling
- Industrial Logistics
- Industrial Data Science
- Industrial Energy Technology

Master studies

1. Applied Geosciences
2. Mining and Tunnelling
3. Raw Materials Engineering
4. Advanced Mineral Resources Development
5. Building Materials and Ceramics
6. Petroleum Engineering
7. Applied and Exploration Geophysics
8. Materials Science
9. Sustainable Materials
10. Polymer Engineering and Science
11. Metallurgy
12. Mechanical Engineering
13. Industrial Environmental Protection and Process Technology
14. Recycling
15. Industrial Logistics
16. Industrial Management and Business Administration
17. Industrial Energy Technology

Bachelor reform objectives

Bachelor Reform

Key objectives

- Sharpening of the curricula (environment, climate, scarcity of resources, ...)
- Increase coherence and clarity of the overall offer
- Reduction of the number of BAC studies
- Bachelor International Studyability, horizontal and vertical permeability, mobility
- Shortening of the average duration of studies
- Focus on essential course content and competencies
- Realistic ECTS weightings
- High degree of digitalization

Study architecture 2024

Bachelor studies

?

- BAC A
- BAC B
- BAC C
- BAC INTERNATIONAL

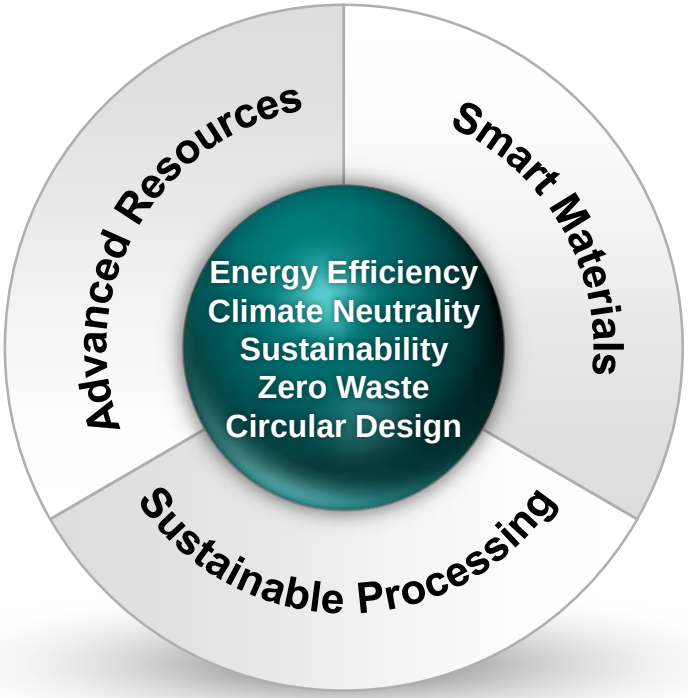
?

Master studies

1. Applied Geosciences
2. Mining and Tunnelling
3. Raw Materials Engineering
4. Advanced Mineral Resources Development
5. Building Materials and Ceramics
6. Petroleum Engineering
7. Applied and Exploration Geophysics
8. Materials Science
9. Sustainable Materials
10. Polymer Engineering and Science
11. Metallurgy
12. Mechanical Engineering
13. Industrial Environmental Protection and Process Technology
14. Recycling
15. Industrial Logistics
16. Industrial Management and Business Administration
17. Industrial Energy Technology

Highly attractive specialties

Positioning and profile 2030



Content positioning with new topics

Future field "Energy & Storage“

- Earth's crust as potential for energy supply and energy storage
- CO2-neutral, alternative use of conventional deposits of energy raw materials including geothermal energy
- Energy transformation & storage
- Hydrogen with focus on production, transport and storage, use as process gas and in interaction with materials

Future field "Space & Extreme Environments“

- Mining of critical resources on asteroids, moons or planets.
- Space exploration: space mining, remote sensing, materials and systems for space transportation and exploration, extraterrestrial geology
- Materials for harsh environments and extreme conditions
- Utilization underground / tunneling: construction, storage, logistics

Future field "Design to Sustainability”

- Climate-neutral production to combat climate change.
- Material and product design considering primary/secondary materials and recyclability; Zero Waste.
- Improved recyclable materials, disassembly & re-use strategies
- Holistic consideration of raw material use with regard to the generation of residual materials and greenhouse gas emissions as well as other environmental impacts

Content

EIT Raw Materials

Sustainable supply of Europe with responsibly produced raw materials from European Deposits

Sustainability starts with Europe's mineral resource potential

European University Network

EURECA-PRO: European University on Responsible Consumption and Responsible Production

- Montanuniversität Leoben, Austria (MUL) – *Lead University*
- Technische Universität Bergakademie Freiberg, Germany (TUBAF)
- Technical University of Crete, Greece (TUC)
- Silesian University of Technology, Poland (SUT)
- University of León, Spain (ULE)
- University of Petrosani, Romania (UP)
- Mittweida University of Applied Sciences, Germany (HSMW)

European University Network

EURECA-PRO

7 Higher Education Institutions based in 6 EU member states

Uniting over
54.500 students,
9.400 staff members and
60 departments/faculties

Supported by
24 associated partners from all over Europe

Content

Universities of Technology addressing the challenges that planet earth is facing

Summary

- Problems are global, so ultimately they can only be solved globally.
- Nevertheless, solutions need to be developed locally and then scaled to the entire planet
- Without technological progress, the challenges will not be met; however: social changes are additionally necessary
- Technical universities have an important role to play in solving the challenges facing planet Earth

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