



Intensive Short Course Drilling Engineering Design June 25 – July 13, 2012

University of Leoben, Austria

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Welcome to Austria



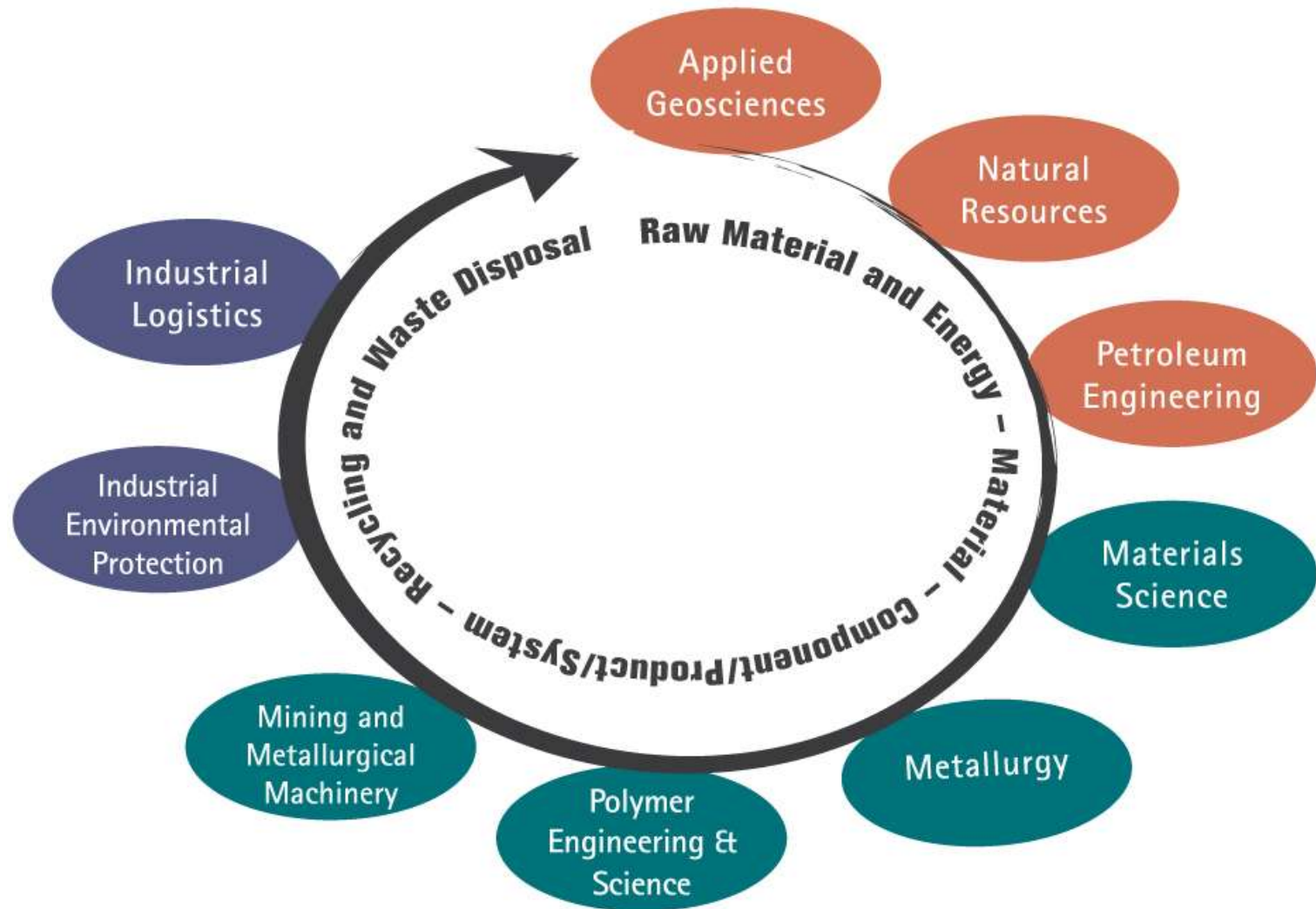
Welcome to the University of Leoben



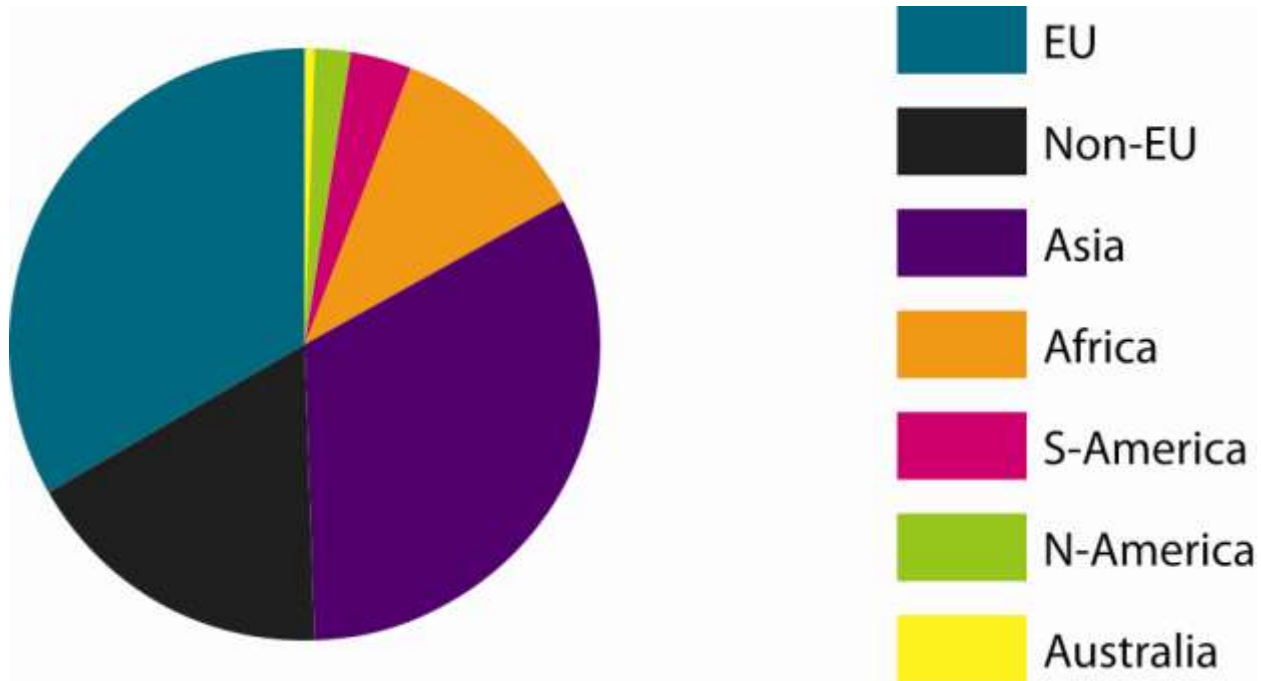
- About 2600 students
- Founded in 1840
- In the middle of Austria
- Engineering programs only
- Big and modern library
- State-of-the-art equipment
- Short distances on campus
- Small town – low expenses
- Friendly inhabitants
- Safe environment
- Major European capitals within a short distance – perfect for travelling







International students





Drilling Engineering Design

3 week`s intensive short course

6 credit hours, 9 ECTS, 27.5 CHPW

15 total days of academics

30 modules

15 lecture modules

15 laboratory modules

Interesting side trips to Salzburg, Vienna,
Eisenerz and Graz (optional, on weekends)

Content: The student will first be introduced to drilling engineering and drilling rigs to understand the engineering requirements for a particular drilling problem.

In a second step the basic mechanical components of a drilling rig and their working principles will be explained. The student will develop an understanding of hoisting, rotating and pumping equipment.

An introduction to electric machines and automation will be given to complete the general overview of all mechatronic components required to design and build a drilling rig. This information will allow the participant to select components, which are able to fulfill the previously defined requirement specifications and lead into a design competition to develop a drilling machine by individual engineering teams.

The final design will outline a drilling machine, based on the specifications developed, its mechanical and electric components, as well as sensors and automation components.

The work is completed with an implementation plan, as well as lab experiments with selected components.

Previous knowledge expected: The course is designed for engineering undergraduate (e.g. mechanical or drilling engineering or similar) who have an understanding of engineering fundamentals, ideally entry level lectures in mechanical and electrical engineering, and automation, basic understanding of drilling engineering. The course also targets graduate students, who are interested in applied engineering problems.

Objective: Develop an integrated view of developing design criteria, specifications for a mechatronic system and to have the opportunity to implement elements of the designed system using the example of a drilling rig.

Successful participants will have an understanding of the basic mechanical and electric components of a drilling rig. They will develop the skills to define engineering requirements and develop these requirements into a technical specification. Furthermore the student will be able to define an implementation plan and work on the implementation of different aspects of the designed drilling machine.

This course will be split into lecturing and exercise, respectively lab elements. Continuous assessment.

Language of instruction: English

Course Outline - Drilling Engineering Design

Week 1

	Day 1 Monday	Day 2 Tuesday	Day 3 Wednesday	Day 4 Thursday	Day 5 Friday
09:00	Introduction to Course, Outline, Objectives	The Drilling Process	Machine Elements	Rig Components: Pumps, Draw Works, Rotary Table, Top Drive, etc.	Rig Components: Pumps, Draw Works, Rotary Table, Top Drive, etc.
09:30					
10:00	Introduction to Drilling Engineering				
10:30					
11:00					
11:30					
12:00	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
12:30					
13:00					
13:30	Introduction to Drilling Engineering	Machine Elements	Machine Elements	Rig Components: Pumps, Draw Works, Rotary Table, Top Drive, etc.	Presentation of Drilling Rig Specification for the Design Exercise, Discussion of Requirements, Definition of Design Teams
14:00					
14:30					
15:00					
15:30					
16:00					

Course Outline - Drilling Engineering Design

Week 2

	Day 6 Monday	Day 7 Tuesday	Day 8 Wednesday	Day 9 Thursday	Day 10 Friday
09:00	Fundamentals of Automation	Fundamentals of Automation	Fundamentals of Automation	Fundamentals of Automation	Finite State Machines
09:30					
10:00					
10:30					
11:00					
11:30					
12:00	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
12:30					
13:00					
13:30	Design Work, Design of Individual Machine Components	Design Work, Design of Individual Machine Components	Design Work, Design of Individual Machine Components	Design Work, Design of Individual Machine Components	Presentation of Design Status by each Team
14:00					
14:30					
15:00					
15:30					
16:00					

Course Outline - Drilling Engineering Design

Week 3

	Day 11 Monday	Day 12 Tuesday	Day 13 Wednesday	Day 14 Thursday	Day 15 Friday
09:00	Digital Control of Dynamic Systems	Digital Control of Dynamic Systems	Design Work, Design of Individual Machine Components	Design Work, Design of Individual Machine Components	Presentation of Final Design by each Team, Formal Presentation to Design Jury
09:30					
10:00					
10:30					
11:00					
11:30					
12:00	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
12:30					
13:00					
13:30	Design Work, Design of Individual Machine Components	Design Work, Design of Individual Machine Components	Design Work, Design of Individual Machine Components	Design Work, Design of Individual Machine Components	Presentation of Final Design by each Team, Presentation to Design Jury, Selection of Winner of Design Contest by Jury
14:00					
14:30					
15:00					
15:30					
16:00					



Application deadline: **February 20, 2012**

Course fee: 480€ for exchange partners, 1280€
general academic price

Accommodation: in privately managed modern
residence halls, approx. 300 €/month, single
room, 200 € double room

Living expenses: depends on you, count 200 €
for food.

Financial proof of 800 € must be provided (side
trips excluded)

Trip to **Salzburg** (optional)

It is the birthplace of Wolfgang Amadeus Mozart and the setting for parts of the musical and film *The Sound of Music* (*Trapp family*), which features famous landmarks in Austria, but focuses mainly on Salzburg .

City and Sound of Music tour

Salt Mine Berchtesgaden

If your visa allows you to enter Germany you can also visit the salt mine. Dressed in miner's clothing, the visitor enjoys rides on a train, a funicular, a raft and down slides through the Salt Mine in Berchtesgaden. On the way to Berchtesgarden you pass Hitler's Eagles Nest and Berghof.

Trip to **Graz** (optional)



Capital of Styria, one of Austria's
provinces

The oldest settlement on the ground of the modern city of Graz dates back to the Copper Age. The old town was added to the UNESCO World heritage list in 1999 due to the harmonious co-existence of typical buildings from different epochs and in different architectural styles.

City tour, Schlossberg, largest armoury of the world (medieval armoury)

Trip to **Vienna** (optional)

Schönbrunn Castle



St. Stephan's Gothic Cathedral, Prater



Visit the capital of Austria, have a tour through the old city (world cultural heritage), visit the emperor's castle, enjoy the amusement park Prater and the famous market Naschmarkt, you might even go to Vienna's English Theatre or see a musical

Trip to **Eisenerz**



Eisenerz ("Iron ore") is a market place and old mining town close to Leoben. At the turn of the past century the *Erzberg* (Ore Mountain) furnished such rich ore that it was quarried in the open air like stone. Iron production started in the 12th century. Visit the show mine and enjoy a ride on Erzberg in a „Hauly“.



Ready to Join Us?



Contact and Information:

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www.petroleumengineer.at/pe-studies/study-program/ded-course.html

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See you in Leoben!

