

Raw  
Materials  
Value  
Chain

# RaVeN

## Master's in Mining Engineering

EIT labelled

Supported by



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ACADEMY

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## Raw Materials Value Chain

Skills and competencies on the sustainable exploitation of raw materials throughout the entire value chain: sourcing, processing, use, recycling, and back to sourcing.

RaVeN MSc fosters creativity, innovation and entrepreneurship; preparing graduates to implement innovative solutions at their workplaces, or to start and run their businesses successfully.

Graduates will be awarded diplomas from AGH University of Science and Technology and TU Bergakademie Freiberg, in addition to the EIT Label certificate!



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# General information

ECTS	120 ECTS
DURATION	24 months
LANGUAGE	English
START DATE	October 2023
GRADUATION	June-July 2025
LOCATION	Cracow (Poland) and Freiberg (Germany)



# EIT Label

The RaVeN programme has received the EIT Label, a quality seal awarded to top Master and PhD programmes that excel in shaping a new generation of students into game changers and innovators.

Students of EIT Label programmes learn how to transform their specialist knowledge with key innovation and entrepreneurship skills into sound solutions to pressing societal challenges.

As a RaVeN student, you are eligible to join EIT RawMaterials Alumni. This organisation provides a great opportunity to network with past and present participants in the many and varied EIT RawMaterials activities, such as business idea competitions, start-ups, professional development courses and Master's and PhD programmes. You can benefit from events, career development and educational activities and much more, forming a hub for a diverse range of raw materials students, academics and professionals. Furthermore, the EIT RawMaterials Alumni provides you with a connection to the wider EIT Alumni community and alumni events around Europe.



# Academic partners



The Faculty of Civil Engineering and Resource Management is the oldest faculty of AGH UST. It is an interdisciplinary institution that educates students in five areas: construction, mining engineering, environmental engineering, industrial process engineering and management, and revitalization of degraded areas. The mission of the Faculty is to educate engineers and conduct scientific research at the highest level in accordance with the current and future needs of the economy and challenges of modern civilization.



# Academic partners



**TUBAF**

Die Ressourcenuniversität.  
Seit 1765.

The TU Bergakademie Freiberg as a resource university focuses with their six faculties on the development of new and alternative techniques to enable a sustainable economy, to deal in a responsible manner with the finite resources of this earth. This includes innovations in exploring techniques and processing of raw materials, developing new energy technologies, materials and recycling processes and contributes significantly to solving economic and ecological challenges. The TU Bergakademie Freiberg was founded in 1765 and is now days the world's oldest mining university with many scientific and industrial partners worldwide.



# Academic partners



**TECHNICAL UNIVERSITY  
OF KOŠICE**

The University's Faculty of Mining, Ecology, Process Control and Geotechnologies (FBERG TUKE) has a strategic position in the field of raw materials in Slovakia, focused on responding with the highest quality service to client needs in the following scientific directions: exploration, mining and processing of primary and secondary raw materials, assessment of the economic value of mineral deposits and all related research fields including the impact of raw material utilization for the environment and wide society. FBERG TUKE is the unique mining faculty in Slovakia. It is active in the education, research and innovation in the sector of raw materials including exploration, mining, processing and all the links of the RaVeN.



# Industry partners



La Palma Research Centre (LPRC) is an independent, internationally active think-tank headquartered on Isla de La Palma, Canary Islands, Spain. LPRC passion is sustainable development, and its strength is delivering out of the box solutions for technology transfer, foresight and policy analysis, social media based marketing, science communication and public engagement. Located in one of Europe's Outermost Regions, LPRC consider it their mission to actively promote the development of our region, representing its interests through international cooperation.

# Industry partners



**Łukasiewicz**

Institute of Non-Ferrous Metals

Łukasiewicz Research Network – Institute of Non-Ferrous Metals (Ł-IMN) is a research centre of the Polish non-ferrous industry. Complex activities cover all stages of metallic materials production: from ore treatment to technologies for production of modern product meeting all environmental standards. Many of the developed solutions became implemented in small and medium enterprises, not only in non-ferrous industry, but also in other branches. The services provided cover: R&D targeted for development of new technologies, optimisation of industrial processes, modernisation of production lines, construction of equipment, measurement and analytical services.



# Study programme

The curriculum is designed to equip students with expertise in sustainable extraction, processing and end-use of raw materials. The comprehensive approach of combining academic and expert knowledge will translate into awareness of, and concern for, the raw materials value chain sector in Europe. The process of knowledge acquisition will be carried out with close co-operation with a broad spectrum of stakeholders – including SMEs and large corporations.



# 1st Semester - AGH UST

COURSES	ECTS	CONDITION
Business training and general trends in the raw materials value chain	1	Obligatory
Sustainable explorations of deposits and modern geological technologies for their identification	2	Obligatory
The challenges of mining activities in the world	3	Obligatory
New trends in the mining technologies and mineral processing	3	Obligatory
Problems on post mining area- water management, reclamation, revitalization	2	Obligatory
Energy efficiency - sustainable sources of energy under renewables requirements	2	Obligatory
Modern and innovative machines and mining methods used in raw materials excavation	2	Obligatory
Economics and Managerial Finance in raw materials	3	Obligatory
Statistical tools and data exploration for digitalization	2	Obligatory
<i>Social effectivity in raw materials management</i>	5	<i>Elective</i>
<i>Social aspects of sustainable development</i>	5	<i>Elective</i>
<i>Environmental engineering</i>	4	<i>Elective</i>
<i>Structures and organizational aspects of lean production</i>	4	<i>Elective</i>
<i>Business models for sustainable market</i>	2	<i>Elective</i>
<i>Sustainable effectivity of processes in circular economy</i>	2	<i>Elective</i>



## 2nd Semester - AGH UST

COURSES	ECTS	CONDITION
Innovative processes for circular economy in the non-ferrous metals industry	4	Obligatory
Modern technologies in Mineral Processing	3	Obligatory
Metallurgical Industry Development	3	Obligatory
Materials science and engineering innovation	3	Obligatory
Innovation Management and Entrepreneurship	2	Obligatory
Summer school	4	Obligatory
<i>Lean production in advanced material development</i>	4	<i>Elective</i>
<i>The quality management of production processes</i>	4	<i>Elective</i>
<i>Eco designing products for circular economy</i>	4	<i>Elective</i>
<i>Reporting on the SDGs</i>	4	<i>Elective</i>
<i>Language B+</i>	2	<i>Elective</i>



## 3rd Semester - TUBAF

COURSES	ECTS	CONDITION
Hydrogeology for GW-Management	6	Obligatory
Radioactivity	6	Obligatory
Reclamation	6	Obligatory
Environmental Geotechnics	3	Obligatory
<i>Management and Finance of Mining Operations along the Life Cycle</i>	6	<i>Elective</i>
<i>Licensing, Stakeholder Involvement and Expectation Management</i>	6	<i>Elective</i>
<i>Project and Contract Management</i>	6	<i>Elective</i>





## 4th Semester - AGH UST

COURSES	ECTS	CONDITION
Industrial practices	4	Obligatory
Master Thesis	20	Obligatory
Seminars		Obligatory
<i>Data reporting spreadsheets with SQL queries</i>	3	<i>Elective</i>
<i>Business Management and Economic Efficiency</i>	3	<i>Elective</i>



# Industry involvement

The study programme in RaVeN comprises a close cooperation with companies at different stages of the entire raw materials value chain in Europe. This approach allows students to receive valuable input from experienced professionals in sustainable extraction, processing and end-use of raw materials. This involvement by industry players are intended to complement the theoretical background acquired through the lectures.



This section of the booklet is intended to introduce you to the non-academic partners involved in RaVeN programme!

# Industry involvement



**Łukasiewicz Research Network – Institute of Non-Ferrous Metals (IMN)** – Polish research institute dealing with the development and implementation of new technologies and products made of non-ferrous metals.



**La Palma Research Centre (LPRC)** – an independent, internationally active think-tank working across a range of topics related to geoscience, environmental issues, blue economy and the Green Deal.



**PRG Linter Inc.** – a company dealing in the provision of comprehensive services for the mining industry and the implementation of specialized mining works, e.g. excavation of galleries, reconstruction of mining excavations, liquidation of roadway excavations, transport of excavated material, construction and maintenance of suspended railway routes, reinforcement of the rock mass and support, construction of pipelines and cable networks.



**PRI Linter Ltd.** – a company dealing with the performance of mining services, specifically preparatory excavations.



**Mine Master Ltd.** – a company specializing in the production and supply of underground mining equipment for underground drilling – drills and anchor trucks with mining tools and supplies of loading and haulage machines.





# Industry involvement



**MedApp Inc.** – a company supporting business creation, building a startup, raising capital or investing on the stock exchange.



**Centre Tecnològic de Telecomunicacions de Catalunya (CTTC)** – a non-profit research institution which research activities, both fundamental and applied, mainly focus on technologies related to the physical, data-link and network layers of communication systems, and to the Geomatics.



**Ilustre Colegio Oficial de Geólogos (ICOG)** – is an official corporation who among its main purposes and functions are the defense of the professional interests of geologists, the observance of deontological principles, avoiding intrusions, preparing reports or collaborating with the different state administrations, as well as facilitating experts for their intervention in judicial matters.



**PBSz Inc.** – a highly specialized company that implements complex investments in the underground construction industry: designs, builds, equips, modernizes vertical and horizontal mine workings using its own innovative technologies, creating a safe underground infrastructure.

# Careers

Graduates' skills and knowledge will be highly valued in the mining and processing, metallurgy, energy, automotive and logistics sectors.

1

## **SUSTAINABLE EXPLOITATION OF RAW MATERIALS THROUGH THE VALUE CHAIN**

RaVeN MSc focuses on creativity, innovation and entrepreneurship, preparing graduates to implement innovative solutions at their workplaces, or even start their own businesses.

2

## **COMPETITIVE ADVANTAGE FOR THE FUTURE WORKFORCE IN THE SECTOR**

RaVeN targets steps of the value chain that are lacking in the current education portfolio of EU institutions.

3

## **FOSTERING ENTREPRENEURSHIP**

RaVeN will also prepare graduates on how to build their own business plan, how to start and run the business the best way: logical operations, legal issues, accounting, funding, and more!



# Requirements and fees

## REQUIREMENTS

- Bachelor's degree in: Geology, Mining Engineering, Mineral Processing, Environmental Engineering, Mechanical Engineering, Metallurgy or similar. Students holding a bachelor's degree in other field can be selected by the decision of the Program Council
- English certificate is welcome. If unavailable, it can be obtained in Poland while studying (cost: 60 EUR).

## TUITION FEES

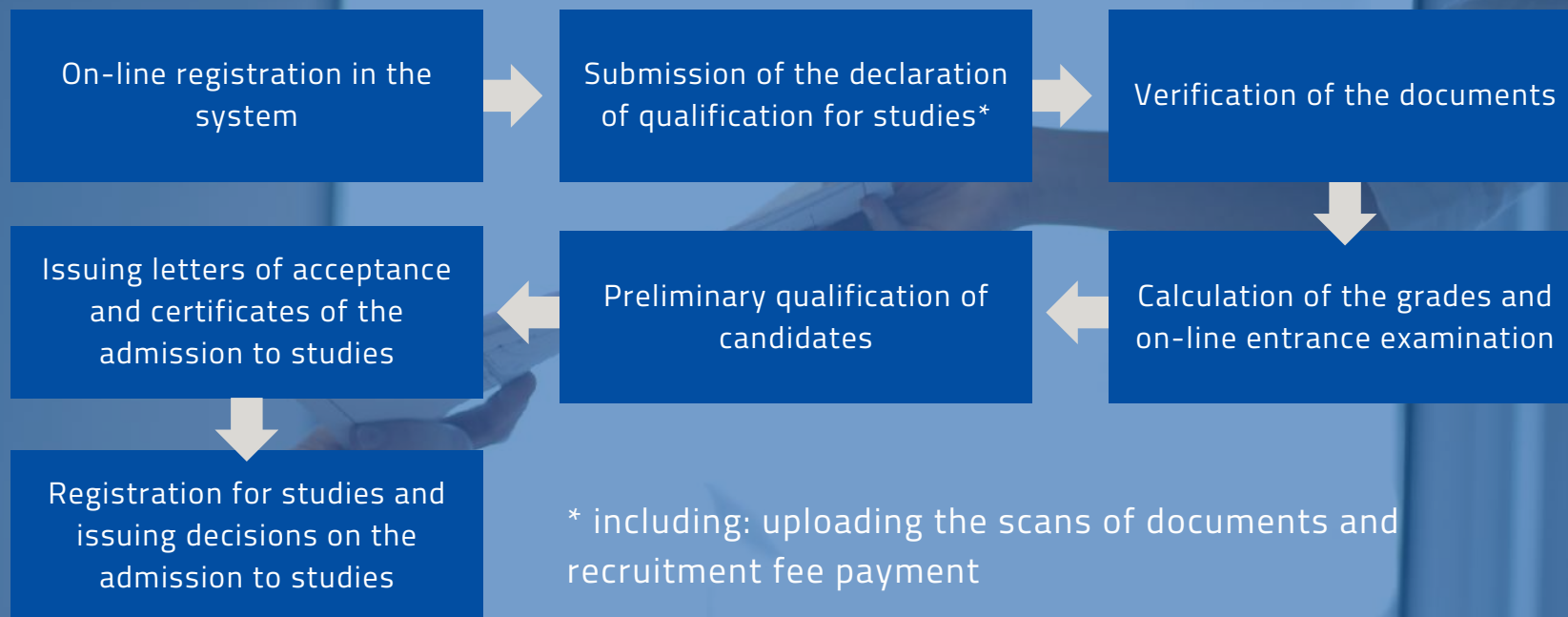
- AGH – not applicable (excluding the recruitment fee - a registration fee of 100 PLN will apply to all students)
- TUBAF – not applicable (excluding the „Semester Fee” of 94€/per semester which is applied to all students at TUBAF) (a semester fee of 300€/semester applies for applicants who already hold a master's degree)

In addition, students have the opportunity to apply for ministerial scholarships: 1) Social scholarship; 2) Rector; 3) Minister

Detailed information is available on the websites of partner universities.



# Application process



Recruitment for RaveN studies will be conducted in two recruitment cycles:

**1st) mid June - mid July | 2nd) late August - mid September**

For more information please visit: <https://www.international.agh.edu.pl/eng/regular-studies/education-offer/second-cycle-master-degree-programmes/raw-materials-value-chain/>



# Other information

## VISA



If you are non-EU citizen and you get accepted for studies at AGH UST and need an official document for visa, we can issue it on your request.

Please remember to make sure that you meet other requirements from the Embassy. To find Polish diplomatic missions in your country, please go to:

<https://www.gov.pl/web/diplomacy/polands-missions-abroad>

## HEALTH INSURANCE



While staying in Poland, you need to have health insurance. More information is available in the section HEALTH AND SAFETY in:

<https://www.international.agh.edu.pl/eng/faq/health-and-safety/>

# Other information

## DORMITORIES



The University Campus provides accommodation as well as space for cultural and sport activities for students of AGH UST and other Cracow's universities.

More information is available at:

<http://www.miasteczko.agh.edu.pl/en/about-us.html>.

Check prices of accommodation at:

<http://www.miasteczko.agh.edu.pl/en/pricing.html>.

When you get accepted as an AGH UST student we will send you information on how to apply for a place in a dormitory.

## LIVING AND WORKING IN POLAND



An estimated cost of living in Poland could be the different and depends on student's lifestyle.

Practical information on living and working in Poland you can find at:

<https://study.gov.pl/cost-living-poland> and:

<https://study.gov.pl/work-and-internships>



# Your life in Cracow

## THE MAGIC OF CRACOW

- Former capital and one of the oldest cities in Poland
- One of the most destinations for tourists
- Cultural capital of Poland,
- Bohemian atmosphere - pubs, restaurants, cafes and more!
- City where Karol Wojtyla (Pope John Paul II) lived
- Points of interest nearby: Auschwitz, Ojców National Park & Castle, Wieliczka Salt Mine

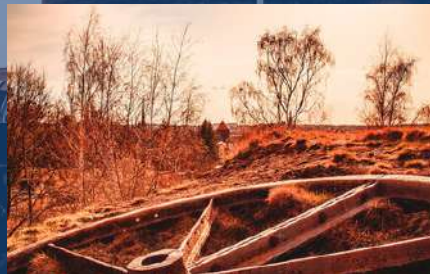




# Your life in Freiberg

## FREIBERG, THE MINING LEGACY

- Freiberg has a long and rich mining history, dating back to the 12th century
- Charming historic city center with medieval architecture
- The Terra Mineralia museum is one of the largest and beautiful mineral exhibitions and a must-see in Freiberg
- Hosts the world's oldest municipal theatre, which can be still enjoyed in its original building
- Colorful and world open student community with clubs and pub mile



# Are you a bachelor's student who:



is motivated to acquire entrepreneurship skills and start your own business?



is willing to support and contribute to the design of products and services for the circular economy?



wants to gain practical experience, contacts in the industry, enrich your CV?



is willing to contribute to securing raw materials supply?



is keen to gain expertise over the entire raw materials value chain?

**If so, RaVeN is the perfect education path for you!**

# Notes

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**LPRC** | LA PALMA  
RESEARCH  
CENTRE



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