RawMaterials ACADEMY

EMerald

Master in Resources Engineering

(Innovative Education in Geometallurgy and Circular Economy)
Awarded the EIT Label in 2016

This activity has received funding from the European Institute of Innovation and Technology (EIT), a body of the European Union, under the Horizon 2020, the EU Framework Programme for Research and Innovation

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Diploma	The consortium will deliver a triple diploma (one from each university where the student attended lectures) and a Diploma Supplement from the coordinating university: – Ingénieur Civil des Mines et Géologue delivered by University of Liège (ULiège) – Master Sciences de la Terre et des Planètes Environnement delivered by University of Lorraine (UL) – Master of Science – Major: Geosciences delivered by Luleå University of Technology (LTU) – Master in Mechanical and Process Engineering delivered by Technische Universität Bergakademie Freiberg (TUBAF) – EIT Label Certificate
Credits	120 ECTS, 24 months
Language of Instruction	English
Starts in	September
Requirements	Eligible candidates must have a Bachelor's degree in Engineering with basic knowledge in Geology or a Bachelor's degree in Minerals Engineering, Mining Engineering, Chemical Engineering, Geological Engineering, Metallurgical Engineering or a Master degree in Geology. At least 22.5 ECTS in Mathematics at university level are required.
Fees	€4,500/year for EU students €9,000/year for non-EU students
Application Period	1 October 2018 – 20 January 2019 for Erasmus Mundus scholarships 1 March 2019 – 30 April 2019 for non-EU self-funded students 1 March 2019 – 30 June 2019 for EU self-funded students
Scholarships	For students beginning in September 2019, EIT-Label scholarships from EIT RawMaterials of up to €9,000 per student are available with additional financial support for student involvement in conferences, summer schools and other events. For information on how EIT-Label scholarships will be awarded and who is eligible, please contact the coordinating university directly: emerald@uliege.be A number of Erasmus Mundus Joint Master Degree scholarships are available – visit em-georesources.eu for details.

"Three months before graduating from this programme, I already had several offers for a PhD position... This only goes to demonstrate the well-rounded skills that we obtained from the Emerald programme."

Jennifer – Philippines

Participating Universities

University of Liège
Belgium

University of Lorraine, ENSG Nancy
France

Luleå Institute of Technology
Sweden

TU Bergakademie Freiberg
Germany

The Challenge

The EMerald Master programme was created to answer the urgent need expressed by the European Union to create a resource-efficient Europe. As the EU recognised the importance of mineral and metal resources in our modern economy, it also realised that the raw materials industries were facing a critical skills shortage.

The EMerald Master programme aims to train a new generation of engineers with an entrepreneurial mindset and a global vision of the value chain, putting the extraction of mineral and metal resources at the beginning of a circle which ends by collecting end-of-life products and recovering valuable materials out of the urban mines (circular economy). Therefore, the Master course will focus on two aspects:

- Bridging the gap between geological exploration and mineral processing by offering innovative education in geometallurgy
- Helping to close the loop in a resource-efficient way by forming professionals who know the processing challenges and the need to meet targets in terms of recyclability

Programme Structure

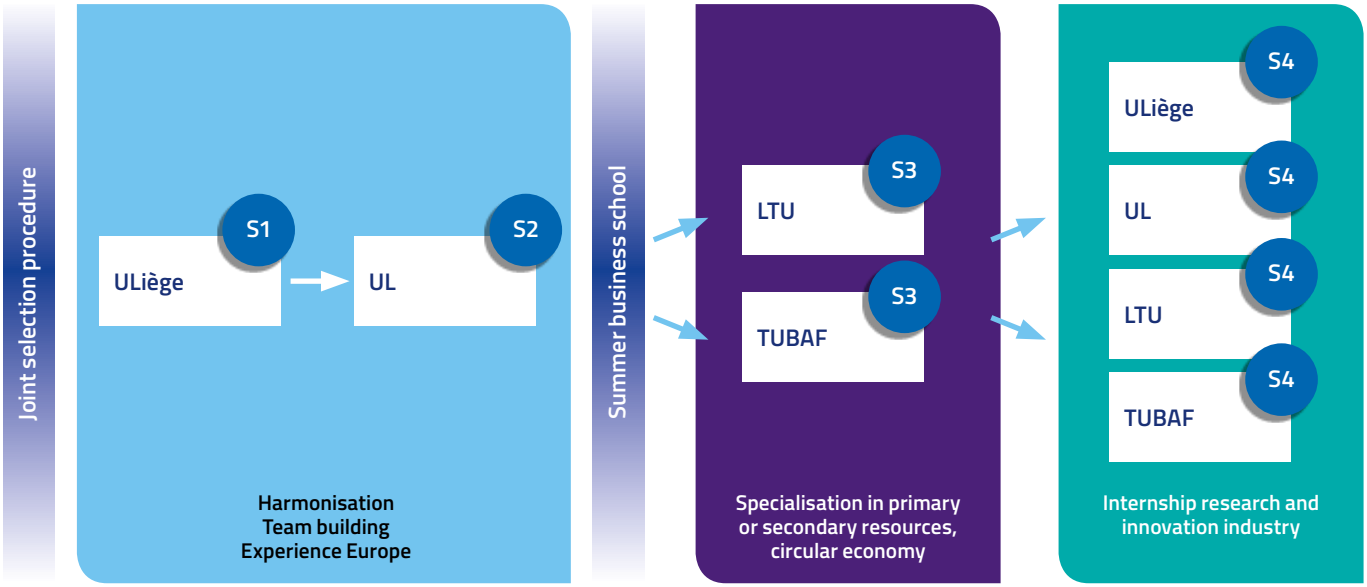
EMerald is organised into four semesters and accounts for 120 ECTS or 30 ECTS per semester.

The first year of the programme aims to harmonise students' knowledge and help them to find the right balance between resources characterisation and modelling, and processing and management techniques (multidisciplinarity). The thematic courses offered by the two universities (ULiège and UL) are complemented by a strong programme to develop transversal skills. Industry experts and invited scholars bring in key contributions on corporate social responsibility, economics, lifecycle analysis and other essential aspects of modern sustainable engineering operations.

All courses offer a blend of theoretical lectures and practical work in the labs. Students often work in groups on a real case study, finding out for themselves possible processing routes for complex ores and waste materials.

The third semester offers students the option to specialise more upstream at LTU (primary resources) or downstream at TUBAF (secondary resources). The final semester can be spent in any of the aforementioned institutions depending on the thesis specialisation. Regardless of the location, the Master thesis will be completed in close collaboration with an industrial partner or a research centre that will also host the students for an internship.

The full catalogue of courses is available on the EMerald website: **www.em-georesources.eu**



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Innovation and Entrepreneurship Training

As an EIT-Labelled programme, EMerald aims to graduate interdisciplinary engineers who possess not only a deep knowledge of georesources, but also a holistic view of the entire raw materials value chain and an entrepreneurial, creative mindset.

The EMerald programme:

- Provides you with the opportunity to gain insight into the industrial world and to raise your awareness and understanding of the whole raw materials value chain through professional seminars and technical visits
- Offers many courses targeted to facilitate the acquisition of entrepreneurial skills. You will learn how to work in teams and communicate your results to a broad public. In certain courses you will conduct real case studies from data integration to the estimation of resources, including economic aspects
- Integrates research dimensions with workshops and your Master thesis, as well as possibilities to attend international meetings (e.g. biennial meetings of the SGA), during which you can meet researchers and explore opportunities if you wish to pursue a career in the research field
- Receives support by leading companies who have an advisory role to the programme through a Strategic Advisory Board (SAB), which ensures that the courses of the programme meet their professional expectations

Between the first and the second year, the EMerald master organises a summer business school, a three week intensive course which will take place in Freiberg in August. As an EMerald student, you will get the opportunity to take solid management courses in finance, marketing, business modelling and operations management, providing you with key insights into how engineering solutions can be applied to, and taken up by, society and industry.

Professional Profiles after Graduation

Are you a student who is:

- Interested in sparking innovation in the raw materials sector?
- Keen to become entrepreneurial and start your own company?
- Interested in bridging the gap between geology and metallurgy?
- Curious to acquire understanding of the whole raw materials value chain?
- Motivated to expand your professional network by studying at least three European universities?

The knowledge and skills EMerald graduates gain are highly valued in industry and beyond. Not only are EMerald graduates qualified to work in the fields of mining, building materials (cement, aggregates), non-ferrous metals production, circular economy of metals and mineral chemistry, possible career paths also include working for:

- Geological surveys
- Junior exploration companies
- Investment banks (resources sector)
- Venture capital (resources sector)
- EU Commission (raw materials and industry)
- National/regional governments (mining laws, implementing circular economy, mineral industry)
- EMerald also prepares you for further study (PhD) in mineral processing, geometallurgy, resources/reserves estimation, process development, mineral industry, etc.

For more information:
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www.em-georesources.eu

The EIT Label: Raising a new generation of entrepreneurs and innovators

EIT RawMaterials Labelled programmes offer you

EIT RawMaterials is able to offer students a unique opportunity to learn in a dynamic environment, focusing on real-life challenges.

EIT RawMaterials is initiated and funded by the EIT (European Institute of Innovation and Technology), a body of the European Union. The EIT Label is a certificate of quality that is awarded only to excellent educational programmes at the Master and Doctoral level.

As a student of an EIT RawMaterials Labelled programme, you'll be part of the largest European raw materials partnership – with more than 120 core and associate partners and 180 project partners from over 22 European countries coming from higher education, research institutions and industry. As an EIT Label student, you will have the opportunity to become part of this committed partnership as well as champion and contribute to the EIT RawMaterials objective of finding new, innovative solutions to secure the sustainable supply of raw materials across the value chain – from exploration, mining and extraction, to mineral processing, recycling and developing circular economy strategies.

EIT RawMaterials aims to raise a new generation of innovators in Europe equipped with the necessary entrepreneurial mindset for designing and delivering solutions. You'll also get the chance to collaborate internationally to develop creative and sustainable solutions to pressing resource and societal challenges.

In short, it's a great opportunity to become a global game-changer, obtain the knowledge, skills and experience employers are seeking out in future graduates, and become part of the RawMaterials Academy Label student community.

Thesis internship placements at leading European companies

The knowledge to become an expert in a particular raw materials discipline, coupled with an overview of the entire raw materials value chain

European mobility – study in at least two European countries

Innovative 'learning-by-doing', challenge-based courses which focus on real-life problems

Membership of the EIT Label Alumni Community

Courses designed to nurture start-up ideas at accelerators and incubators

Study tours and site visits to companies and industrial sites

New ways of learning – online courses, virtual and augmented reality and MOOCs

Course modules dedicated to entrepreneurship and innovation skills and competences

EIT RawMaterials Innovation support: business plan competitions, innovation bootcamps, seed funding

EIT RawMaterials summer schools and interdisciplinary courses

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2019 version

EIT RawMaterials is supported by the EIT, a body of the European Union