



RawMaterials  
ACADEMY

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the European Union



# The EIT-Labelled Master's Programmes

LAUNCH YOUR CAREER

IN RAW MATERIALS



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# Introduction

A scenic view of a mountain range with several wind turbines on the peaks, set against a backdrop of a clear blue sky and distant mountains. The foreground shows a lush green hillside with a dirt road winding through it. The wind turbines are white and stand prominently on the ridges. The overall atmosphere is serene and emphasizes renewable energy in a natural setting.

Our modern lifestyle relies on raw materials. From the iron and steel of our railway infrastructure to the gold and silver in the circuitry of smartphones: raw materials are everywhere. Even the transition to a climate neutral future requires cobalt for electric vehicles, lithium for rechargeable batteries, silicon for photovoltaics and solar panels, and rare earth elements for wind turbines that generate renewable energy.

As the world grows smaller and more hyper-connected, the impact of society on the Earth has never been more visible. It is now clear that we need to shift to a circular economy in order to responsibly use the Earth's finite resources. But what can just one individual do to help? More than you think! Real change requires courage, innovative thinking, and collective action – the same skill set that EIT RawMaterials Academy looks for in prospective students. Are you ready to mine your raw talent, help shape a more circular, green economy, and create sustainable solutions for tomorrow?



# What do we offer students?

EIT RawMaterials Academy offers students a unique opportunity to learn in a dynamic environment, focusing on real-life challenges. Awarded 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 granted only to excellent educational programmes at the master's and doctoral level.

As a student of an EIT-Labelled programme from EIT RawMaterials Academy, you'll be part of the largest European raw materials network with more than 120 core and associate partners and 180 project partners, including higher education professionals, researchers, and industry experts from over 20 European countries. As an EIT Label student, you will be welcomed into this network and will champion and contribute to the EIT RawMaterials goals of finding new, innovative solutions to secure the sustainable supply of raw materials across the value chain: from explo-

ration, mining and extraction, to mineral processing, recycling and the movement towards a circular economy. EIT RawMaterials aims to equip a new generation of innovators in Europe with the necessary entrepreneurial mind-set for designing and delivering materials solutions. You'll also get the chance to collaborate internationally and develop sustainable solutions to pressing economic, environmental and societal challenges. And long after you graduate, you can stay connected via EIT RawMaterials Alumni.



JOIN AN EIT-LABELLED PROGRAMME AND BECOME A  
GLOBAL GAME-CHANGER, ARMED WITH THE KNOWLEDGE,  
SKILLS AND EXPERIENCE EMPLOYERS SEEK.



# What to expect?

→ Thesis internship placements at leading European companies

→ Membership of the EIT RawMaterials Alumni community

→ 'Learning by doing' with challenge-based courses that focus on real-life problems

→ Study tours and visits to innovative companies and industrial sites

→ Exciting new ways of learning: online courses, virtual and augmented reality and MOOCs

→ Courses designed to nurture start-up ideas with accelerators and incubators

→ Course modules dedicated to entrepreneurship and innovation skills

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

→ Expertise in a raw materials discipline – a comprehensive understanding of the entire raw materials value chain

→ EIT RawMaterials summer schools and interdisciplinary courses

→ European mobility – study in at least two European countries

# Exclusive activities and support for EIT-Labelled students

Students on EIT-Labelled master's programmes within the EIT RawMaterials Academy receive a range of additional opportunities to boost their innovation and entrepreneurship skills, grow their network in the raw materials sector and gain the experience they need to thrive.

These exclusive events bring together EIT-Labelled students from across the Master School, and form the basis of your shared learning experiences, making you a full member of the EIT RawMaterials community.

## SEMESTER 1

- **Label Induction Days.**  
Meet the EIT RawMaterials Academy and learn how to get involved in our community and access the many opportunities on offer. Sign up for EIT RawMaterials Alumni and start growing your network.
- Vote for your representative on the Label Student Board, or stand for election!

## SEMESTER 2

- **Label Start-Up! Days.**  
Get together with 100 Label students to meet and learn from five EIT RawMaterials supported start-ups. Hear about the experience of setting up a company in the raw materials sector, and network with entrepreneurs.
- All costs covered by EIT RawMaterials.





## SEMESTER 3

→ **The RACE.**

The Raw and Circular Economy Expedition is a challenge-based summer school for 70 students from around the world, taking place over two weeks in four different European countries. Find out more at [race.eitrawmaterials.eu](https://race.eitrawmaterials.eu).

- All costs covered by EIT RawMaterials for Labelled students selected for participation.

## SEMESTER 4

→ **Label-Launch!**

Celebrate completing your EIT-Labelled Master's programme during EIT RawMaterials' major event – the RM Summit. Take part in matchmaking events with EIT RawMaterials industry partners and start-ups, and make new connections with raw materials professionals.

# Do you have a raw materials business idea?

EIT RawMaterials offers a range of support for individuals and companies with innovative business ideas, including:

## Pre-Jumpstarter Workshop

- This exclusive event for students on the EIT RawMaterials Academy Labelled master's programmes offers support to develop your thinking around a start-up idea and, in particular, to prepare you to apply to the EIT Jumpstarter.

## EIT Jumpstarter

- One of Europe's top pre-accelerator programmes, to help you develop your business idea and understand what's needed to create a successful start-up.

## Booster call

- Financial and network access support for start-ups and SMEs in the raw materials sector.

## EIT RawMaterials Accelerator

- A three-stage accelerator programme to help start-ups with a developed product to bring their solution to the market.

# EIT RawMaterials Alumni

From the moment you join an EIT-Labelled master's programme in the EIT RawMaterials Academy, 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.

It is run by and for its members, who 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.



# Programmes

Six Master's programmes within the EIT RawMaterials Academy hold the EIT Label. Graduates from all EIT-Labelled programmes are awarded a degree from one or more of the participating universities, with an EIT Label Certificate confirming graduation from an EIT-Labelled programme.



## AMIR

Master in  
Advanced Materials:  
Innovative Recycling



## AMIS

Master in Advanced  
Materials for Innovation  
and Sustainability



## EMerald

Master in Resources  
Engineering (Innovative  
Education in Geometallurgy  
and Circular Economy)



## **RaMES**

Master in  
Raw Materials Exploration  
and Sustainability



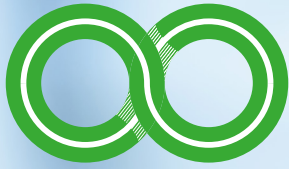
## **SINReM**

International Master  
of Science in Sustainable  
and Innovative Natural  
Resource Management

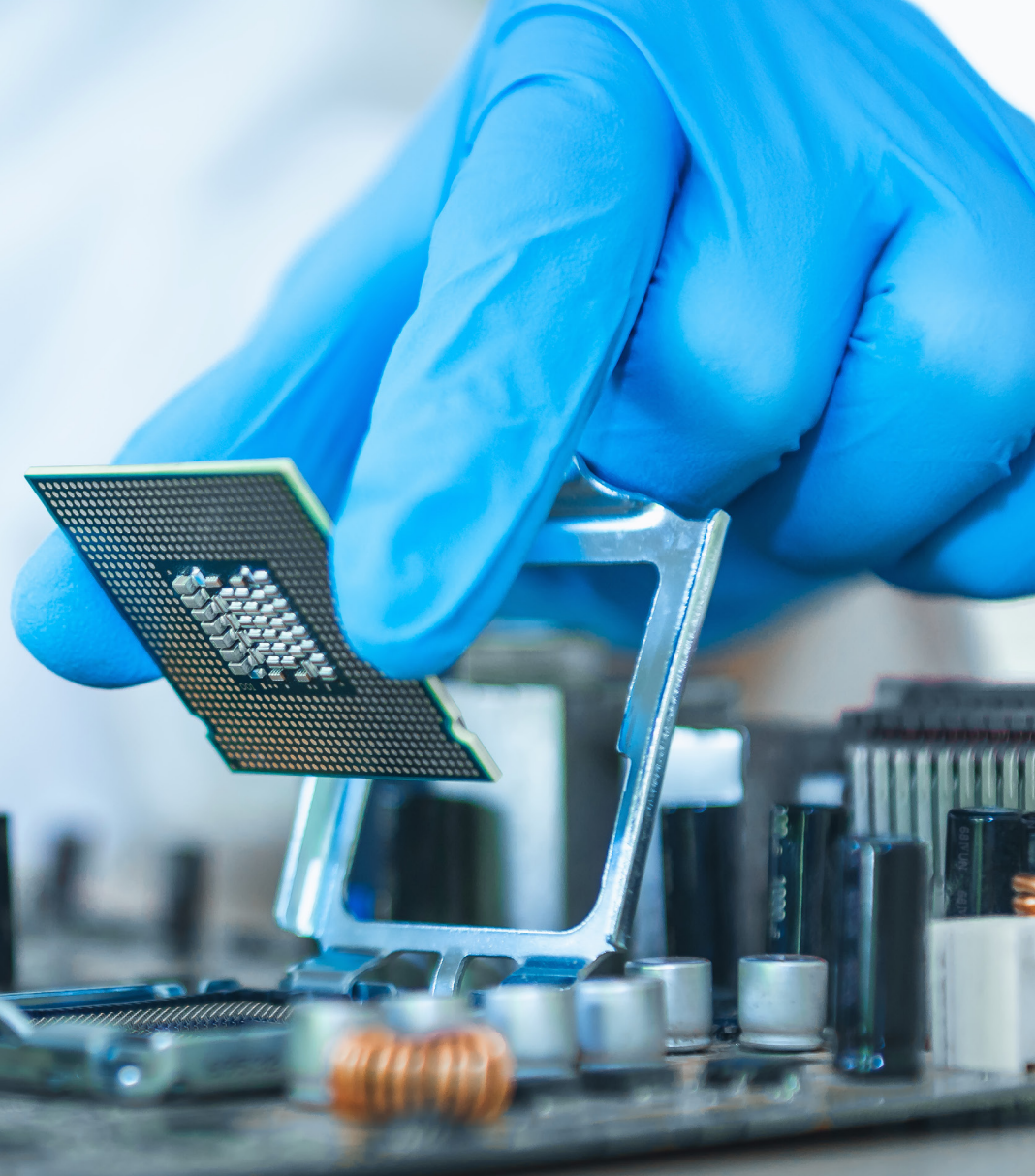


## **SUMA**

Master in  
Sustainable Materials



**AMIR master**



# Master in Advanced Materials: Innovative Recycling

Awarded the EIT Label in 2018

## **THE CHALLENGE**

Materials are the building blocks of the modern global economy and are instrumental for the transition to a green, circular economy that emits less CO<sub>2</sub>. Thirty of these materials have been defined by the EU as critical, meaning that they are both highly important to the EU economy and in dangerously low supply. Accessing the known primary raw material sources has become more challenging, while amounts of industrial waste and end-of-life-products are rapidly increasing. These waste streams contain secondary raw materials,

many of which are critical and can be recovered, diversifying supply and delivering usable materials to meet increasing demands. To achieve this, we need skilled professionals with advanced technical knowledge of recycling, an understanding of the full raw materials value chain and the skills required to transform knowledge into solutions and business. The AMIR master's programme was created to fulfil this need by educating future international professionals who will develop new routes for materials recycling.

<b>Double Diploma</b>	Graduates of the AMIR programme will be awarded a single or double Master of Science degree, depending upon their chosen pathway. Graduates will also be awarded the EIT Label Certificate.
<b>Credits</b>	120 ECTS, 24 months
<b>Language of Instruction</b>	English
<b>Starts in</b>	September
<b>Requirements</b>	The programme is aimed at candidates who have a bachelor's degree in Engineering and Environmental Sciences with advanced knowledge in Chemistry (minimum 3 years of study or 180 ECTS credits), or a bachelor's degree in Chemistry, Physical-Chemistry, Materials (or Matter) Sciences. Candidates must also demonstrate English language proficiency.
<b>Tuition fees</b>	Please consult the AMIR website ( <a href="http://www.amir-master.com">www.amir-master.com</a> )
<b>Application Period</b>	Check <a href="http://www.amir-master.com">www.amir-master.com</a> for details
<b>Scholarships</b>	For students beginning in September 2021, EIT Label scholarships from EIT RawMaterials of €13,500 per eligible student are available. For information on how EIT Label scholarships will be awarded and who is eligible, please contact the coordinating university directly: <a href="mailto:amir-master@eitrawmaterials.eu">amir-master@eitrawmaterials.eu</a> . Additional scholarships and grants may be available – visit <a href="http://www.amir-master.com">www.amir-master.com</a> for details.



I chose AMIR because I want to help change the unsustainable lifestyle that causes high environmental impacts, without compromising economic stability. When I finish the master's, I want to find a job in an R&D department of an important company, able to produce important changes.

— RICARDO, SPAIN

#### PARTICIPATING UNIVERSITIES

**University of Bordeaux**

France

**NOVA University Lisbon**

Portugal

**TU Darmstadt**

Germany

**University of Liège**

Belgium

**Technical University of Madrid**

Spain

**University of Miskolc**

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# Master in Advanced Materials: Innovative Recycling

Awarded the EIT Label in 2018

## INNOVATION AND ENTREPRENEURSHIP TRAINING

As an EIT-Labelled programme, the AMIR master's integrates high-level training on entrepreneurship and innovation into its curriculum, giving students the skills they need to become game-changers in the recycling sector.

→ During year 1, the Leading Innovation and Entrepreneurship module focuses on market/customer orientation and cooperation with stakeholders. You will learn to develop and apply customer/user-focused thinking as well as how to identify and cooperate with stakeholders. The objective is to train the entrepreneurs of tomorrow, able to create innovative projects, understand problems, detect needs and devise solutions.

→ The University of Bordeaux works closely with the incubator 'IRA' and with the technology transfer organisation 'AST'. These are open to AMIR students and interact closely with the university's laboratories, in which all AMIR students spend 8 weeks during internships.

→ Industrial seminars allow AMIR students to learn directly from some of the most important industries in the sector. For example, the French Alternative Energies and Atomic Energy Commission; ArcelorMittal, the world's largest steel producer and one of the main actors in metal recycling; and Veolia.

→ Industry internships give AMIR students up to six months of experience with an industrial or research partner, gaining extensive real-life experience in research or industry. Partners include Arkema, ArcelorMittal, Veolia and Fraunhofer, ensuring that students gain the top-level experience necessary for success in finding employment or becoming entrepreneurs on completion of their studies.

## ARE YOU A STUDENT WHO IS:

- Interested in the full value chain of raw materials?
- Keen to make a difference in confronting the challenges surrounding waste and contributing to the development of sustainable solutions?
- Motivated to spend time working with top companies and research organisations in the recycling sector?
- Driven to become an entrepreneur or intrapreneur who makes innovation happen?

## PROFESSIONAL PROFILES AFTER GRADUATION

Graduates of the AMIR programme will be fully equipped to take on professional roles in the recycling sector:

- Process optimisation
- Materials design
- Plant administration
- Project administration

Furthermore, the skills gained are widely required across sectors, including information and communication technologies, building construction, energy, machinery tools, and mobility. Graduates also obtain the necessary skills and knowledge to set up their own company or work in sales and marketing. Finally, doctoral studies are another possibility, and graduates of the AMIR programme will be fully equipped to enter PhD programmes in the recycling sector to pursue engineering careers or academic research.





### **AMIR: MASTER IN ADVANCED MATERIALS: INNOVATIVE RECYCLING**

The AMIR master's programme focuses on the raw material value chain, with particular emphasis on recycling. The two main objectives of the programme are:

- To educate students to become highly-skilled European professionals with expertise in various types of materials. This expertise will enable them to develop, on a large and ambitious scale, new methods for materials recycling. In addition, the AMIR programme includes classes on transversal skills such as innovation, ethics, intellectual property, life cycle assessment, sustainability and advanced research strategies.
- To develop a deep entrepreneurship mindset among students with the help and expertise of associated businesses, incubators and innovation services as well as a large panel of industries.

AMIR students benefit from a high-level education and research environment including access to advanced research laboratories. High-quality internships, together with mandatory international and intersectoral mobility, ensure that students gain the practical experience and skills

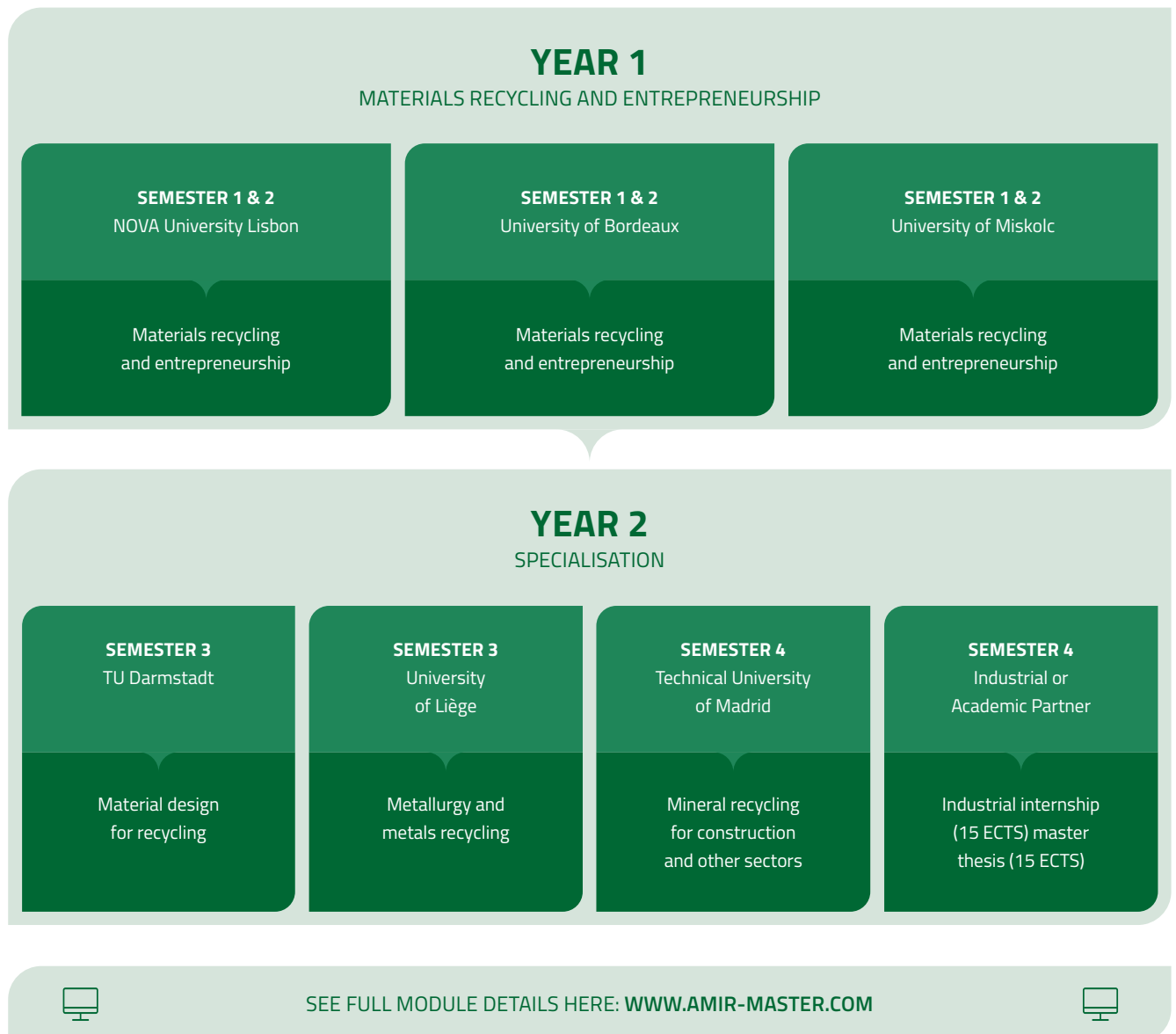
necessary to make a difference as recycling professionals. The curriculum of AMIR was designed with the strategic goal of producing T-shaped professionals and entrepreneurs for the raw materials sector with:

- solid knowledge of the properties and processing of various types of materials (metals, minerals, ceramics, polymers), based on multidisciplinary training by physicists, chemists, process engineers, and others.
- in-depth proficiency in recycling, material chain optimisation for end-of-life products, and design of products and services for the circular economy.
- an entrepreneurial mind-set, formed with the help and expertise of partners from the industry as well as Research and Technology Organisations (RTOs) and associated businesses and incubators.
- essential transferable skills for researchers such as intellectual property, research ethics and scientific communication.

# Programme Structure

**YEAR 1** of the master's programme takes place at the University of Bordeaux, NOVA University Lisbon or the University of Miskolc. Students learn about general and technical aspects of the raw materials value chain (general chemistry, material science, the lifecycle of materials), as well as about the main learning outcomes expected from an EIT-Labelled programme: sustainability, intellectual transformation, value judgments (ethical, scientific and sustainability challenges), creativity, innovation, leadership and entrepreneurship. In addition, a new module focusing on batteries has been introduced into the programme at Bordeaux, in line with the key trend of electrification in the development of sustainable materials for future mobility.

**YEAR 2** takes place at one of the other partner universities, allowing students to gain specialist knowledge in their area of interest. This is followed by an industrial internship and completion of the master thesis.





A pair of hands wearing blue nitrile gloves holds a clear petri dish. Inside the dish, there is a green, branching, filamentous organism, likely a type of algae or microorganism, growing on a dark substrate. The background is a blurred laboratory setting.

# Master in Advanced Materials for Innovation and Sustainability

Awarded the EIT Label in 2016

## THE CHALLENGE

As global and EU populations and subsequent welfare demands increase, consumption per capita is also on the rise. In the EU especially, consumption has outpaced production, particularly with respect to the more complicated, resource-intensive technologies and products that have become part of daily life. As a result, recycling is of utmost importance to diversify our supply sources and meet society's needs.

AMIS is a master's programme in Advanced Materials for Innovation and Sustainability. The primary objective of the programme is to provide students with an understanding of the full raw materials value chain and a mind-set for innovation and entrepreneurship focusing on sustainability. AMIS tackles this challenge by focusing on three themes – all of which are central themes of EIT RawMaterials:

- Substitution of critical or toxic materials in products for optimised performance
- Material chain optimisation for end-of-life products
- Product and services design for the circular economy

AMIS aims to train T-shaped professionals – experts in a particular raw materials discipline with an overview of the entire raw materials value chain. T-shaped professionals also work closely with industry professionals to explore how innovation and entrepreneurship can strengthen the market uptake of raw materials solutions.

Through the programme, AMIS students will become experts in the field of raw materials, particularly in sustainable functional materials, while gaining a holistic view of the value and process chain.

<b>Double Diploma</b>	<b>From two of the following:</b> <ul style="list-style-type: none"> <li>– Grenoble INP: Master Science et Génie des Matériaux</li> <li>– Aalto University: Master of Science (Technology): Functional Materials for Global Challenges</li> <li>– TU Darmstadt: Master of Science in Materials or Master of Science in Physics or Chemistry</li> <li>– University of Bordeaux: Master Sciences et Technologies, mention CHIMIE, Advanced Hybrid Materials: Composites and Ceramics by Design</li> <li>– University of Liège: Master Sciences Physiques or Master Sciences Chimiques</li> <li>– EIT Label Certificate</li> </ul>
<b>Credits</b>	120 ECTS, 24 months
<b>Language of Instruction</b>	English
<b>Starts in</b>	September
<b>Requirements</b>	Eligible candidates must have a bachelor's degree in Science, Technology or Engineering (Physics, Chemistry, Materials Science) or its equivalent, as well as an English language certificate.
<b>Tuition fees</b>	EU students 2021: €1,000/year Non-EU students 2021: €8,000/year Check amis-master.eitrawmaterials.eu for up-to-date information.
<b>Application Period</b>	1st round: 1 October 2020 – 31 January 2021 2nd round: 1 February 2021 – 30 April 2021
<b>Scholarships</b>	For students beginning in September 2021, EIT Label scholarships from EIT RawMaterials of €13,500 per eligible student are available. For information on how EIT Label scholarships will be awarded and who is eligible, please contact the coordinating university directly: <a href="mailto:contact@amis-master.eu">contact@amis-master.eu</a>



I chose the AMIS master's because it gives me the opportunity to spend one year of my master's degree at a university in another European country, and I also really like the ideas about future orientation, innovation and sustainability.

— **BASTIAN, GERMANY**

#### PARTICIPATING UNIVERSITIES

**Aalto University**

Finland

**University of Bordeaux**

France

**Technische Universität Darmstadt**

Germany

**Grenoble INP**

France

**University of Liège**

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# Master in Advanced Materials for Innovation and Sustainability

Awarded the EIT Label in 2016

## INNOVATION AND ENTREPRENEURSHIP TRAINING

Robust entrepreneurship education is a cornerstone of AMIS. Students will have the benefit of well-rounded, hands-on innovation and entrepreneurship training that will equip them for a professional future, including joint collaboration courses with AMIS partners:

- Project-based courses (Inno Projects I and II) focusing on development of business models for the commercialisation process of new technologies
- The one-week intensive summer school working in teams on industry case studies to create new or significantly improved products, services, processes, policies, new business models or jobs
- Inno-Mission Internship: work experience in a company or research organisation developing a solution-focused approach by translating innovations into feasible business solutions and the commercialisation of new technologies
- Practical work on various industrial projects integrated with innovation and entrepreneurship content

Throughout the programme, students will have the opportunity to meet with relevant academic contacts in the innovation and entrepreneurship ecosystem as well as non-academic partners (industries, research and training organisations, entrepreneurs) who will also support future career building.

The objective is to share best practices to enable learning from their methods and mistakes. If the results of a master thesis are deemed suitable, AMIS graduates can also expect assistance from partners in setting up a business or spin-off.

## ARE YOU A STUDENT WHO IS:

- Interested in sparking innovation in the raw materials sector?
- Keen to become entrepreneurial and start your own company?
- Motivated to find real solutions to environmental and societal challenges?
- Interested in hands-on learning in industry and research companies?

## PROFESSIONAL PROFILES AFTER GRADUATION

AMIS alumni skills and knowledge will be highly appreciated by industries in the Materials Science domain or by laboratories, especially in the following sectors: microelectronics, optics, bio-technologies, energy, communication and environment. As a resource engineer, potential career paths include:

**Academic career/research:** at universities and research institutions, whether teaching students or in managerial positions. Scientists with high commercialisation awareness, knowledge and competence who can effectively communicate the commercial value of their scientific research.

**Resource industry:** SMEs in chemistry, exploration, green energy, machinery and plant construction, the metal working industry, ceramics, environmental economy (R&D, product development, management, production, marketing and sales). Expert or manager whose actions and decisions influence the innovation output, value creation and performance of the company.

**Freelancer and entrepreneur:** creating one's own business or becoming a consultant.

**Wider society:** science journalism, consulting, project development and management, advisor to policy makers, administration, specialist agencies, media, etc.

# Programme Structure

AMIS is a two-year programme:

**YEAR 1** takes place at Grenoble INP, Aalto University or TU Darmstadt. Once students have chosen their entry university, AMIS provides a general curriculum in Materials Sciences, including mandatory courses in Advanced Functional Materials and Innovation, Business and Entrepreneurship.

**YEAR 2** is the specialisation year and takes place at one of the five consortium partner universities. Year 2 includes mandatory courses in Advanced Functional Materials with a specialisation in material interfaces, nanomaterials, cera-

mics or hybrids, as well as the master thesis, a research and development experience in material science jointly supervised by home university professors and host non-academic partners. Student mobility is an integrated part of the programme, involving study at two of the five consortium partner universities, depending on your chosen speciality. Year 1 and Year 2 must be taken at universities in different countries.

## MOBILITY AMIS YEAR 1 (60 ECTS)

### TRACK 1

Grenoble INP

### TRACK 2

Aalto University

### TRACK 3

TU Darmstadt

#### Topics:

- Advanced functional materials
- Innovation, business and entrepreneurship
- Project work on business models and commercialisation of technologies
- Non-academic internship



SUMMER SCHOOL: DEVELOPING SOLUTIONS TO INDUSTRIAL CHALLENGES



## MOBILITY AMIS YEAR 2 (60 ECTS)

### TRACK 1

TU Darmstadt  
Aalto University  
University of Liège

### TRACK 2

TU Darmstadt  
University of Liège  
University of Bordeaux  
Grenoble INP

### TRACK 3

Aalto University  
University of Liège  
University of Bordeaux  
Grenoble INP

#### Topics:

- Advanced functional materials with specialisation
- Practical work on industrial challenges using innovation and entrepreneurship
- Specialised approach to business modelling
- Thesis carried out with university and AMIS partners
- Non-academic internship

#### Darmstadt

Functional  
ceramics

#### Aalto

Nanomaterials  
and interfaces

#### Liège

Nanomaterials  
and modelling

#### Bordeaux

Advanced  
hybrid materials

#### Grenoble

Materials  
and interfaces



# Master in Resources Engineering

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

## THE CHALLENGE

The EMerald master's 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's programme aims to train a new generation of engineers with an entrepreneurial mind-set and a global vision of the value chain, putting the extraction of mineral and metal resources on a circle that continues by collecting end-of-life products and recovering valuable materials out of urban mines (circular economy). Therefore, the master's 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



<b>Double Diplom</b>	The consortium will deliver a triple diploma (one from each university where the student attended lectures) and a Diploma Supplement from the coordinating university: <ul style="list-style-type: none"> <li>– Ingénieur Civil des Mines et Géologue delivered by University of Liège (ULiège)</li> <li>– Master Sciences de la Terre et des Planètes Environnement delivered by University of Lorraine (UL)</li> <li>– Master of Science – Major: Geosciences delivered by Luleå University of Technology (LTU)</li> <li>– Master in Mechanical and Process Engineering delivered by Technische Universität Bergakademie Freiberg (TUBAF)</li> <li>– EIT Label Certificate</li> </ul>
<b>Credits</b>	120 ECTS, 24 months
<b>Language of Instruction</b>	English
<b>Starts in</b>	September
<b>Requirement</b>	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's degree in Geology. At least 22.5 ECTS in Mathematics at university level are required. Candidates must also demonstrate proficiency in the English language.
<b>Tuition fees</b>	EU students 2021: €4,500/year Non-EU students 2021: €9,000/year For up-to-date fee information, visit <a href="http://www.em-georesources.eu">www.em-georesources.eu</a>
<b>Application Period</b>	12 November 2020 – 14 February 2021 for Erasmus Mundus scholarships 1 March 2021 – 30 April 2021 for non-EU self-funded students 1 March 2021 – 30 June 2021 for EU self-funded students
<b>Scholarships</b>	For students beginning in September 2021, EIT Label scholarships from EIT RawMaterials of €13,500 per eligible student are available. For information on how EIT Label scholarships will be awarded and who is eligible, please contact the coordinating university directly: <a href="mailto:emerald@uliege.be">emerald@uliege.be</a> A number of Erasmus Mundus Joint master's degree scholarships are available, covering full tuition fees and living expenses – visit <a href="http://www.em-georesources.eu">www.em-georesources.eu</a> for details.

**PARTICIPATING UNIVERSITIES****University of Liège**

Belgium

**University of Lorraine, ENSG Nancy**

France

**Luleå Institute of Technology**

Sweden

**TU Bergakademie Freiberg**

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# Master in Resources Engineering

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

## INNOVATION AND ENTREPRENEURSHIP TRAINING

As an EIT-Labelled programme, EMerald aims to nurture 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 mind-set.

- 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
- As an EIT-Labelled programme, EMerald aims to nurture 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 mind-set.
- Receives support from 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's 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

The knowledge and skills EMerald graduates gain are highly valued in the industry and beyond. Not only are EMerald graduates qualified to work in the fields of mining, building materials (cement, aggregates), non-ferrous metals production and 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.



**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 with at least three European universities?

# 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 find the right balance between resource 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, life cycle 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, discovering 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](http://www.em-georesources.eu)



The EMerald master's programme has given me an engineering perspective of the whole raw materials value chain. Being an EIT-Labelled programme, I've had the opportunity to be part of several EIT Raw-Materials-organised events which present extensive opportunities for networking and professional development.

— ALI, PAKISTAN

## YEAR 1

HARMONISATION, TEAM BUILDING, EXPERIENCE EUROPE

### SEMESTER 1 (30 ECTS)

University of Liège

#### Select courses for 30 ECTS between:

- Process Mineralogy (5ECTS)
- Solid Waste and By-Products Processing (5ECTS)
- Geostatistics (5ECTS)
- Seminars on Economical and Societal Issues
- Mining and Recycling (5ECTS)
- Mineral Resources (5ECTS)
- Mineral Processing (5ECTS)
- Numerical Analysis (5ECTS)
- Exploitation of Mineral Deposits (5ECTS)

### SEMESTER 2 (30 ECTS)

University of Lorraine

- Advanced Characterisation of Mineral/Water interface (5ECTS)
- Case Study of Ore Processing (5ECTS)
- Resources Modelling and Evaluation (5ECTS)
- Management of Resources (5ECTS)
- Exploitation of Mineral Raw Materials and Environmental Impact of Mining (2ECTS)
- Advanced Mineral Processing (8ECTS)



SUMMER BUSINESS SCHOOL



## YEAR 2

CIRCULAR ECONOMY, SPECIALISATION IN PRIMARY OR SECONDARY RESOURCES

### SEMESTER 3 (30 ECTS)

Luleå University of Technology  
Primary Resources

- Mining Geology (7.5 ECTS)
- Mineral Processing II (7.5 ECTS)
- Geometallurgy (7.5 ECTS)

#### Elective courses:

- Senior Design Project in Mineral Processing (7.5 ECTS)
- Simulation of Mineral Processing (7.5 ECTS)

### SEMESTER 3 (30 ECTS)

TU Bergakademie Freiberg  
Secondary Resources

- Project- Process Design Mineral Processing/ Recycling (8ECTS)
- Practice of Secondary Raw Materials (4 ECTS)
- Thermodynamics and Heat Transfer (4 ECTS)
- Selective Separation of Strategic Elements (5 ECTS)
- Resource Management (6ECTS)

#### Elective courses:

- Mineral Liberation Analysis of Mineral Resources (3ECTS)
- Simulation of Sustainable Metallurgical Process (6ECTS)

### SEMESTER 4 (30 ECTS)

University of Liège

### SEMESTER 4 (30 ECTS)

University of Lorraine

### SEMESTER 4 (30 ECTS)

Lulea University of Technology

### SEMESTER 4 (30 ECTS)

TU Bergakademie Freiberg

Master thesis



RaMES

# RaMES: Master in Raw Materials Exploration and Sustainability

Awarded the EIT Label in 2020

## THE CHALLENGE

Effective exploration and discovery of new primary Raw Materials are of great importance for securing future supplies in the global economy. Within this context, one of the global challenges is the creation of the next generation of resource specialists within the raw materials world. These specialists must have extensive knowledge of primary raw materials, broad competences and skills in identifying and characterising raw materials in the anthroposphere (e.g. tailings, landfills, or in-use stocks), and sensitivity to pressing managerial and business challenges that the effective exploration of raw materials poses. Understanding the

large-scale, socio-economic metabolism underlying the complex raw materials value chain is of vital importance for geologists and all other professionals working with raw materials. Consequently, there is an increasing need to broaden research and educational perspectives to secure future supplies.

Following this approach, RaMES is an MSc degree that blends a Resource Geology curriculum with subjects devoted to exploration and the deployment of raw materials as a sustainable process.

<b>Diploma</b>	The master's programme delivers a Diploma Supplement from The University of Bologna. The programme will award graduates an EIT Label Certificate in addition to the Master's Degree.
<b>Credits</b>	120 ECTS, 24 months
<b>Language of Instruction</b>	English
<b>Starts in</b>	October 2021
<b>Requirements</b>	Eligible candidates must have a bachelor degree in Geology, Earth sciences, Mining engineering, Environmental engineering or similar. Candidates must also demonstrate proficiency in the English language.
<b>Tuition fees</b>	€4,080/year. Fees may be lower depending on family income.
<b>Application Period</b>	Check <a href="http://www.master-rames.eu">www.master-rames.eu</a>
<b>Scholarships</b>	For students beginning in September 2021, EIT Label scholarships from EIT RawMaterials of €13,500 per eligible student are available. For information on how EIT Label scholarships will be awarded and who is eligible, please contact the coordinating university directly: <a href="mailto:info@rames-master.eu">info@rames-master.eu</a>



I chose RaMES because I believe that raw materials represent a sector that in the coming years will be fundamental to meet the new challenges of society. The international perspective of the course, and its ability to provide a holistic approach to raw materials, are characteristics that make this course completely different and innovative compared to a classic MSc in Geology.

— **LUCA, ITALY**

#### PARTICIPATING UNIVERSITIES

**The University of Bologna**

Italy

**The Norwegian University of Science and Technology**

Norway

**The Geological Survey of Finland**

Finland

#### FOR MORE INFORMATION

[www.master-rames.eu](http://www.master-rames.eu).

[info@master-rames.eu](mailto:info@master-rames.eu)

# RaMES: Master in Raw Materials Exploration and Sustainability

Awarded the EIT Label in 2020

## INNOVATION AND ENTREPRENEURSHIP TRAINING

This training is provided by the Entrepreneurship and Business Models and Mineral Resource Economics and Management courses. These show first-hand how entrepreneurship is both a process and a mindset, and this is achieved through the simulation of the creation of a start-up company. They offer an introduction to the reality of professional life, providing a first insight into the possible practical interactions between individual RaMES courses and companies.

The Entrepreneurship and Business Models and Mineral Resource Economics and Management courses mostly utilise teamwork, class presentations, and interactive discussions in tandem with class teaching to build competencies. They involve students in a business idea contest that is pitched in front of a panel of experts. This contest delivers a prize to the group of students with the best idea. The Mineral Resource Economics and Management course includes the development of business plans related to the innovative use of raw materials. Students also develop business ideas that are later pitched in the Entrepreneurship and Business Models course. Moreover, the Final Thesis, as a joint academia-industry project, represents further innovation and entrepreneurship training.

## PROFESSIONAL PROFILES AFTER GRADUATION

Given the worldwide demand for professionals in mining and minerals engineering and management, graduates of RaMES have promising career opportunities. RaMES graduates will be qualified to work for:

- Mining companies and companies engaged in mineral processing technology
- Companies working on ore deposits and integrated production
- Market leaders in efficient dredging and mining
- Aggregates companies

## ARE YOU A STUDENT WHO IS:

- Interested in mineral deposits and their bearings on the raw material value chain?
- Interested in sparking innovation in the raw materials sector?
- Motivated to spend time working with companies and research organisations in the raw materials and sustainability sectors?
- Driven to become an entrepreneur or intrapreneur who makes innovation happen?

→ Government agencies

→ Engineering and consulting firms

→ Knowledge institutions, research institutes and think-tanks

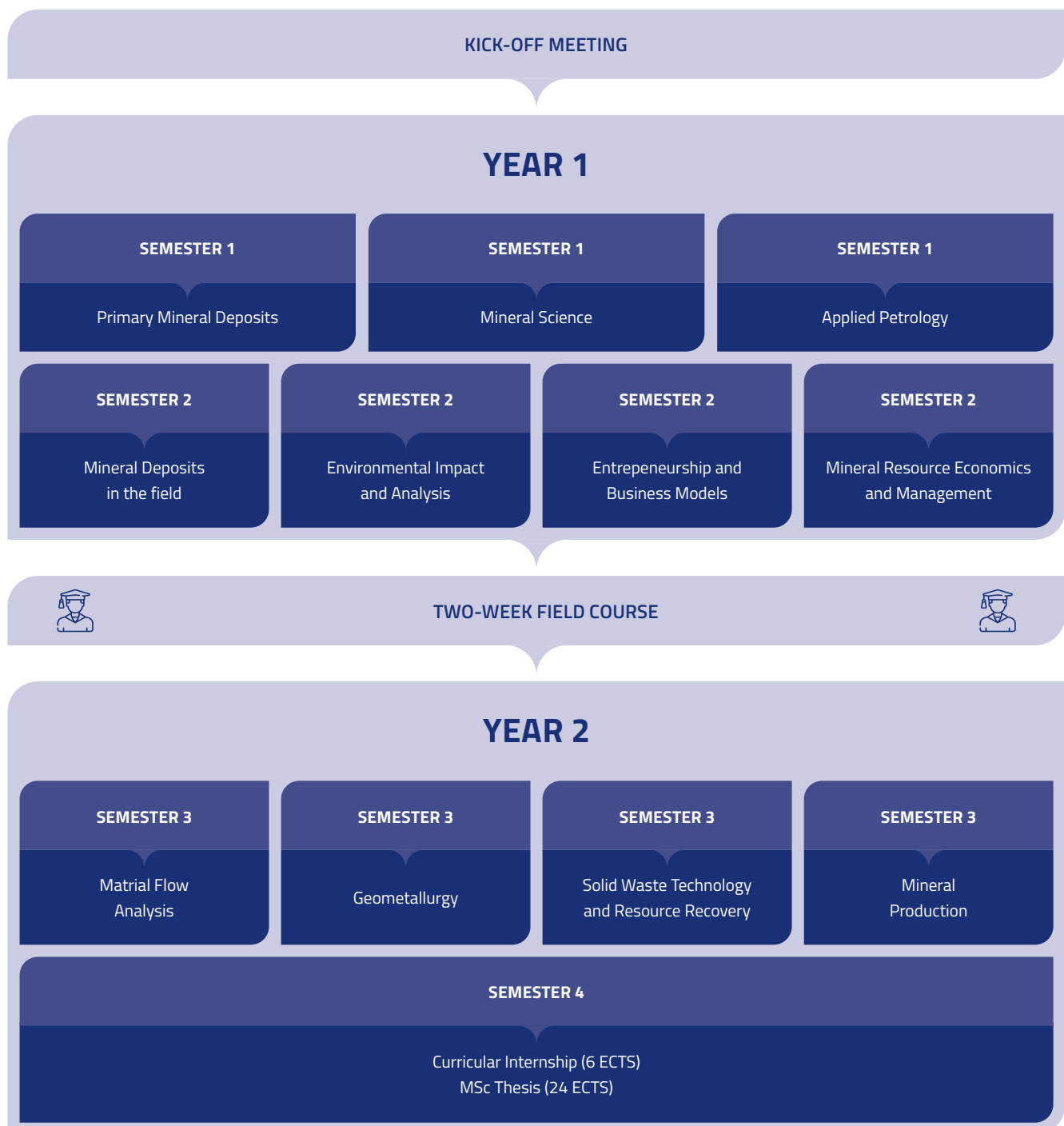
Alternatively, the entrepreneurial and innovative skills which you have developed during the programme will help you to set up your own business.



# Programme Structure

The programme consists of four semesters. During the first and second semester the University of Bologna will deliver eight courses (60 ECTS), including one elective (6 ECTS). During the third semester, the programme consists of four courses that are delivered by the Norwegian University of Science and Technology (24 ECTS), as well as a two-week field course: field methods of Raw Material exploration (6

ECTS), delivered by the Geological Survey of Finland. Semester four may include an Internship for the preparation of the Final Thesis and the Thesis itself, carried out with an industrial partner (total: 30 ECTS). The Curricular Internship may be carried out in tandem with the Final Thesis with an industrial partner, but in that case it will be of 15 ECTS and the Thesis will also be 15 ECTS.





# International Master of Science in Sustainable and Innovative Natural Resource Management

Awarded the EIT Label in 2017

## THE CHALLENGE

Sustainability is more than just a buzzword. Raw materials are one of the fastest depleting resources on Earth. A steady and sustainable supply of many of these materials is vital for a decarbonising society, renewable energy infrastructure, electric mobility and also consumer products and electronics. The outdated make-take-use-dispose model is no longer valid in a world of finite resources. In order to deal with this challenge, three leading European universi-

ties cooperated to develop a new Erasmus and master's programme — the International Master of Science in Sustainable and Innovative Natural Resource Management (SINReM). SINReM was created to educate a new generation of professionals who can engineer technology to reinvent materials science and gain competence, expertise and confidence in developing solutions in the sustainable use of materials.

<b>Double Diploma</b>	Joint diploma of International Master of Science in Sustainable and Innovative Natural Resource Management from Ghent University, TU Freiberg and Uppsala University. – EIT Label Certificate
<b>Credits</b>	120 ECTS, 24 months
<b>Language of Instruction</b>	English
<b>Starts in</b>	September
<b>Requirements</b>	A bachelor's degree (minimum 180 ECTS) in engineering or science including 15 ECTS in mathematics and/or physics and 10 ECTS in chemistry, or an equivalent qualification from a recognised university or engineering college.
<b>Tuition fees</b>	European (EEA) 2020: €6,000/year All others 2020: €12,000/year Visit <a href="http://www.sinrem.eu">www.sinrem.eu</a> for up-to-date fee information.
<b>Application Period</b>	European (EEA): until 31 May 2021 Non-European: until 28 February 2021
<b>Scholarships</b>	For students enrolling in September 2021, EIT Label scholarships from EIT RawMaterials of €13,500 per eligible student are available. European EIT RawMaterials scholarship holders receive a partial tuition fee waiver down to €2,000 per year. Additionally, a number of Erasmus Mundus full scholarships of up to €49,000 for the two years are available, covering full tuition fees and living expenses. For information on how EIT Label and Erasmus Mundus scholarships will be awarded and who is eligible, please contact the coordinating university directly: <a href="mailto:sinrem@ugent.be">sinrem@ugent.be</a> .



SINReM provides strong connections with the industry from day one. Companies, educational and research institutions with crucial roles in the RM industry support us with lectures, seminars, internships and thesis work to let us know what is going on in the sector.

— FELIPE, CHILE

#### PARTICIPATING UNIVERSITIES

##### **Ghent University**

Belgium

##### **TU Bergakademie Freiberg**

Germany

##### **Uppsala University**

Sweden

#### FOR MORE INFORMATION

T: +32 9 264 59 24

[sinrem@ugent.be](mailto:sinrem@ugent.be)

[www.sinrem.eu](http://www.sinrem.eu)

# International Master of Science in Sustainable and Innovative Natural Resource Management

Awarded the EIT Label in 2017

## INNOVATION AND ENTREPRENEURSHIP TRAINING

SINReM graduates are trained to excel in creativity, have an entrepreneurial mind-set, a multidisciplinary view and innovative problem-based technology development skills.

Several integrated courses throughout the programme stimulate the exchange of knowledge and experience between the students, lecturers and non-academic stakeholders who are active in the value chain, and challenge students to develop and apply multi-disciplinary and creative problem-solving techniques.

The SINReM programme also provides complementary skills training to teach students to assess the environmental and societal impact of interventions in the value chain (e.g. resource assessment) and to be creative and innovative not only in an academic research environment, but also in business environments.

These courses include modules on innovation management, entrepreneurship and business plan development that prepare the students for their master thesis research and for the start of a future start-up or spin-off.

## ARE YOU A STUDENT WHO IS:

- Interested in exploring how to use engineer technologies to improve the use of finite raw materials?
- Keen to learn how innovation and entrepreneurship competence and skills can position you to contribute both to current industries and create your own start-up?
- Motivated to work closely with industry and research on developing science-based solutions to pressing challenges?

## PROFESSIONAL PROFILES AFTER GRADUATION

**Entrepreneur:** SINReM prepares you to start your own business. You will interact with company founders from the raw materials sector, gain the necessary knowledge and skills for innovation management and IPR, learn to develop and analyse business models and plan how to implement research results into application. Industrial partners and the research transfer/ business development departments of the three partner universities are also there to support you.

**Work in the Industry:** Create a spin-off from an existing company or become a resource engineer in research departments or technological departments of small, medium and large companies worldwide.

SINReM gives its students a broad view on the entire value chain and its varying aspects, but also its opportunities and limitations. SINReM students acquire knowledge on the different (technological) options for optimising flows of natural resources in the different parts of the value chain, ranging from resource exploration to sustainable materials use and use of resources in production processes to

recovery/recycling of resources from end-of-life products. As part of SINReM, students will work together with peers from diverse backgrounds to carefully assess how to manage the Earth's resources in an economically sustainable way, with no negative environmental and societal impact. Students will instigate a paradigm shift in the industry by developing a holistic view on raw materials processing.

## YEAR 1

### SEMESTER 1

Ghent University

- Introduction to the circular economy, economics and management of natural resources (4 ECTS)
- Clean technology (5 ECTS)
- Environmental inventory techniques (3 ECTS)
- Rational use of materials (5 ECTS)
- Resource recovery and recycling technologies (5 ECTS)
- Workshop on problems and innovations in the process chain of mineral resources at TU Freiberg (4 ECTS)

### SEMESTER 2

Uppsala University

- Georesource exploration and characterisation (5 ECTS)
- EIT RawMaterials network seminar (5 ECTS)
- Innovation management and entrepreneurship (10 ECTS)
- Elective course (5 ECTS)
- Summer course on Resource chemistry at TU Freiberg (9 ECTS)



HOLISTIC VIEW OF THE VALUE AND PROCESS CHAIN



## YEAR 2

ELECTIVE MAJOR

Ghent University

- Circular societies (15 ECTS)
- Resource recovery and sustainable materials (15 ECTS)
- Industrial internship (10 ECTS)
- Master thesis (30 ECTS)

Uppsala University

- Entrepreneurship (15 ECTS)
- Georesource Exploration (15 ECTS)
- Industrial internship (10 ECTS)
- Master thesis (30 ECTS)

TU Freiberg

- Sustainable processes (15 ECTS)
- Industrial internship (10 ECTS)
- Master thesis (30 ECTS)



DEEP UNDERSTANDING OF ONE SUBJECT AREA



# Master in Sustainable Materials

Awarded the EIT Label in 2016

## **Sustainable Material Solutions with SUMA**

The SUMA master's programme aims to train tomorrow's resource engineers to work collaboratively in a global world, gathering together some of the best educational programmes in the field of sustainable materials engineering in Europe. The goal is to ensure young scientists obtain a solid background in chemistry and physics, with competences for designing and tailoring new material systems for specific

functions and with a specific view to the sustainability of processes and technologies in the field of material development. SUMA puts a particularly strong focus on innovation, entrepreneurship and leadership and takes a holistic approach to the materials paradigm by exploring circular (eco) design, materials substitution, life cycle engineering and circular economy design, materials processing and recycling, manufacturing and innovation.

<b>Double Diploma</b>	<p><b>Dual Master of Science degree awarded from two of the following universities:</b></p> <ul style="list-style-type: none"> <li>– KU Leuven</li> <li>– Montanuniversität Leoben</li> <li>– University of Trento</li> <li>– Grenoble INP</li> <li>– University of Milano-Bicocca</li> </ul> <p>EIT Label Certificate</p>
<b>Credits</b>	120 ECTS, 24 months
<b>Language of Instruction</b>	English
<b>Starts in</b>	September
<b>Requirements</b>	Generally, all students should have: Bachelor of Science or Bachelor of Engineering (or equivalent), as well as proof of English language proficiency. Candidates must meet the admission criteria of the master's degree programmes of both partner institutions of their chosen track. Please refer to the individual entry university websites for information on admission requirements.
<b>Tuition fees</b>	<p>Fees vary based on programme track and country of origin.</p> <p>Total fees for EEA students range from €77 to €5,500.</p> <p>Total fees for non-EEA students range from €600 to €12,000.</p> <p>Visit <a href="http://www.master-suma.eu/study/#paths">www.master-suma.eu/study/#paths</a> for details</p>
<b>Application Period</b>	<p>Application for the SUMA programme is a multi-step process. Applicants should register on the SUMA website: <a href="http://www.master-suma.eu">www.master-suma.eu</a></p> <p>For information on the registration/application deadlines for the entry universities, please check the following:</p> <p><b>KU Leuven</b> <a href="http://www.kuleuven.be/english/application/instructions">www.kuleuven.be/english/application/instructions</a></p> <p><b>Montanuniversität Leoben</b> <a href="https://international.unileoben.ac.at/en/7169/">https://international.unileoben.ac.at/en/7169/</a></p> <p><b>University of Trento</b> <a href="https://international.unitn.it/incoming/admission">https://international.unitn.it/incoming/admission</a></p> <p><b>University of Milano-Bicocca (UNIMIB)</b> <a href="https://en.unimib.it/education/how-enrol">https://en.unimib.it/education/how-enrol</a></p>
<b>Scholarships</b>	For students beginning in September 2021, EIT Label scholarships from EIT RawMaterials of €13,500 per eligible student are available. For information on how EIT Label scholarships will be awarded and who is eligible, please contact the coordinating university directly: <a href="mailto:master-suma@kuleuven.be">master-suma@kuleuven.be</a>

## PARTICIPATING UNIVERSITIES

### **KU Leuven**

Belgium

### **Montanuniversität Leoben**

Austria

### **University of Trento**

Italy

### **Grenoble INP**

France

### **University of Milano-Bicocca**

Italy

## FOR MORE INFORMATION

### **Department of Materials**

### **Engineering – KU Leuven**

Kasteelpark Arenberg 44/2450

3000 Leuven, Belgium

### **SUMA Project Manager:**

Katarzyna Janusz

T: +32-16377876

[master-suma@kuleuven.be](mailto:master-suma@kuleuven.be)

[master-suma.eu](http://master-suma.eu)

# Master in Sustainable Materials

Awarded the EIT Label in 2016

## INNOVATION AND ENTREPRENEURSHIP TRAINING

As an EIT-Labelled master's programme, SUMA recognises the importance of providing students with the opportunity to explore the economic relevance of sustainable materials solutions and how they are practically implemented in industrial and societal settings. SUMA students will be provided with innovation and entrepreneurship training addressing the following:

- Courses dealing with the implementation of an innovation strategy at a company level and the management of the product development process and strategic management, creativity and decision-making for product development
- Business simulation games
- Testimonies given by young entrepreneurs on the role of engineering in the start-up of technological spin-off companies
- Case studies presented by industrial and company experts in the field
- Small group and individual project work addressing real world problems

## ONE-WEEK SUMMER SCHOOL

Every year the SUMA master's programmes organise a summer school where all students from the different tracks come together to learn from leading experts on a particular sustainable materials topic. During the summer school, students will work together in teams on societal and technological challenges, using the knowledge and lecture content from the expert summer school faculty. The 2019 SUMA summer school supported the SUMA master students in developing competencies in the field of entrepreneurship. The courses and activities were focused on methods and tools to guide the process of start-up creation. Theoretical approaches for new business creation were presented and students were invited to develop and pitch ideas related to start-up creation.

## ARE YOU A STUDENT WHO IS:

- Interested in earth sciences, mining, materials sciences and engineering?
- Motivated to explore the connection between materials technology and its environmental and socio-economic factors?
- Keen to become entrepreneurial and start your own company?
- Motivated to work closely with industry and research on cutting-edge challenges?

## ATLANTIC COPPER CHAIR ACTIVITIES (ACCHAIR)

In 2021, ACCHAIR, supported by Atlantic Copper, the leading Spanish copper producers, in collaboration with the Technical University of Madrid (UPM), will organise 15 conferences taught by international experts in extractive and recycling metallurgy, emphasizing the most recent scientific and technological innovations of these fields. All the ACCHAIR conferences will be live streamed to students from all the universities of the SUMA consortium.

Additionally, ACChair will organise a summer school open to all SUMA students. The course will last one week with three days of classes at the UPM and three days of visits to mining projects and metallurgical plants in the Spanish pyrite belt. The ACCHAIR summer school takes place each year in July.

## PROFESSIONAL PROFILES AFTER GRADUATION

The SUMA master's programme aims at training scientists with a solid background in chemistry and physics, with competences for designing and tailoring new material systems for specific functions, and with a specific view to the sustainability of processes and technologies in the field of material development. The main job opportunities are in industries and research centres in Europe, working on the development and production of functional materials for





advanced applications and high technology. Graduates can start a career as highly valued future leaders in positions of responsibility in managing advanced material design, production processes and material qualifying protocols in high-tech firms, material diagnostics and analysis in industries and research centres, and material development projects and scientific research projects in the field of material science and technology innovation.

#### **SUSTAINABLE MATERIAL SOLUTIONS WITH SUMA**

The SUMA master's programme aims to train tomorrow's resource engineers in collaborative work in a global world, gathering together some of the best educational programmes in the field of sustainable materials engineering in Europe. The goal is to ensure young scientists obtain a solid background in chemistry and physics, with competences for designing and tailoring new material systems for specific functions, and with a specific view to the sustainability of processes and technologies in the field of material development. SUMA puts a particularly strong focus on innovation, entrepreneurship and leadership and takes a holistic approach to the materials paradigm by exploring circular (eco) design, materials substitution, life cycle engineering and circular economy design, materials processing and recycling, manufacturing and innovation.



For me the SUMA master's programme is one of the most enriching opportunities I've ever taken part in. It combines the tools for broadening my knowledge on the topics I'm passionate about, getting to know lots of people with different backgrounds and attend events and seminars from experts of the sustainability world. It's a life changing experience.

— **DAVIDE, ITALY**

# Programme Structure

The Sustainable Materials (SUMA) master's programmes are two-year programmes embedded in the engineering programmes of the participating universities. There are in total 9 tracks, each of which has been awarded the EIT Label. Each track of the SUMA programme consists of one full year at an entry university, followed by a second year at one of the other participating universities.

Visit [master-suma.eu](http://master-suma.eu) to explore the different SUMA tracks and module options.

## SUMA MOBILITY YEAR 1 (60 ECTS)

**TRACK 1**  
KU Leuven

Sustainable  
Materials Track

**TRACK 2**  
University of Trento  
(UniTrento)

Sustainable  
Materials Track

**TRACK 3**  
University of  
Milano-Bicocca  
(UNIMIB)

Materials  
Development Track

**TRACK 4**  
Montanuniversität  
(MU) Leoben

Sustainable  
Metallurgy Track

**Topics:**

- Materials and processing
- Sustainability and recycling
- Circular (eco) design and life cycle engineering
- Materials substitution and manufacturing



SUMMER SCHOOL ON CIRCULAR ECONOMY



## SUMA MOBILITY YEAR 2 (60 ECTS)

**1A** → Grenoble INP  
**1B** → UniTrento  
**1C** → MU Leoben  
**1D** → UNIMIB

**2A** → Grenoble INP  
**2B** → UniTrento  
**2C** → MU Leoben

**3A** → KU Leuven

**4A** → KU Leuven

**Topics:**

- Innovation, entrepreneurship and leadership (30 ECTS)
- Industrial internship (6 ECTS)
- Master thesis (24 ECTS)



Labelled by:



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