



RawMaterials
ACADEMY

EIT RawMaterials and the EIT Label

Introduction to the EIT-Labelled Master Programmes



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

The EIT Label

What is EIT RawMaterials and how can I contribute to their mission?

EIT RawMaterials is the largest and strongest consortium in the raw materials sector worldwide. Its vision is a European Union where raw materials are a major strength. EIT RawMaterials aims to train the next generation of raw materials experts, offering prospective students the unique opportunity to learn holistically about raw materials and circular economy challenges through the lens of entrepreneurship and innovation. During and after graduating from EIT RawMaterials Labelled programmes, the classroom becomes a laboratory, ideas are converted to solutions and graduates become societal game-changers.

EIT RawMaterials is part of a unique European initiative: EIT, the European Institute of Innovation and Technology. EIT's educational mission is to raise a new generation of innovators in Europe with an entrepreneurial mindset. 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 will be part of the largest global raw materials partnership – with more than 100 partners from 20 EU countries coming from academia, research institutions and industry. Your collaboration will contribute to the EIT RawMaterials vision of finding new, innovative solutions to secure the sustainable supply of raw materials across the entire raw materials value chain – from mining to extraction, processing to reuse, recycling and circular economy strategies.

Are you interested in:

- **Becoming a global game-changer?**
- **Collaborating internationally to develop creative and sustainable solutions to resource and societal challenges?**
- **Gaining practical experience in your chosen industry sector, rather than only learning theory in a lecture hall?**
- **Getting involved in a dynamic start-up scene?**
- **Enhancing your educational experience and obtaining dual/joint degrees by spending each semester at different top universities?**
- **Becoming part of the EIT Alumni Community?**
- **Then the EIT RawMaterials Labelled programmes are for you!**

Why should I apply to an EIT Labelled programme?

EIT RawMaterials Labelled programmes offer you all of this



Seven Education programmes within the EIT RawMaterials Academy have been awarded the EIT Label

Five Master programmes

- AMIS – Master in Advanced Materials for Innovation and Sustainability
- EMC – European Mining Course
- EMerald – Master in Georesources Engineering
- SINReM – Master in Sustainable and Innovative Natural Resource Management
- SUMA – Master in Sustainable Materials

Two Doctoral programmes

- IDS-FunMat-INNO – International Doctoral School in Functional Materials
- NEAT Materials – New Approaches and Technologies in Materials Production

Graduates from all EIT-labelled programmes are awarded either a dual or joint degree from at least two of the participating universities, with an EIT Label certificate confirming graduation from an EIT-labelled programme.

AMIS

Master in Advanced Materials for Innovation and Sustainability

Awarded the EIT Label in 2016

Double Diploma	<p>From two of the following:</p> <ul style="list-style-type: none"> • Grenoble INP: Master Science et Génie des Matériaux • Aalto University: Master of Science (Technology) • TU Darmstadt: Master of Science in Materials or Master of Science in Physics or Chemistry • University of Bordeaux: Master Sciences et Technologies, mention CHIMIE, spécialité Synthèse et Propriétés des Matériaux Inorganiques – FAME Hybrids and Ceramics • University of Liège: Master en sciences physiques or Master en sciences chimiques - EIT Label Certificate
Credits	120 ECTS, 24 months
Language of Instruction	English
Starts in	September
Requirements	Eligible candidates must have a Bachelor degree in Science, Technology or Engineering (Physics, Chemistry, Materials Science) or its equivalent, as well as an English language certificate.
Fees	1.000€/year for EU students 8.000€/year for non-EU students
Application Period	1st Round: November to January 2nd Round: February to April
Scholarships	For students beginning in September 2018, EIT scholarships up to EUR 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 scholarships will be awarded and who is eligible, please contact the coordinating university directly: contact@amis-master.eu

Participating Universities

- Aalto University – Finland
- University of Bordeaux – France
- Technische Universität Darmstadt - Germany
- Grenoble INP – France
- University of Liège – Belgium

The Challenge

As global and EU population increases along with well-being and welfare, consumption per capita is also increasing. 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, the importance of recycling and the circular economy will continue to increase in order to diversify our sources of supply and meet our needs.

AMIS is a Master 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 and for optimized performance
- Material chain optimization for end-of-life products
- Product and services design for the circular economy

AMIS focuses primarily on metal and mineral raw materials. However, bio-base and polymer materials are covered in terms of their substitution potential, as well as other materials in the context of multi-material product recycling.

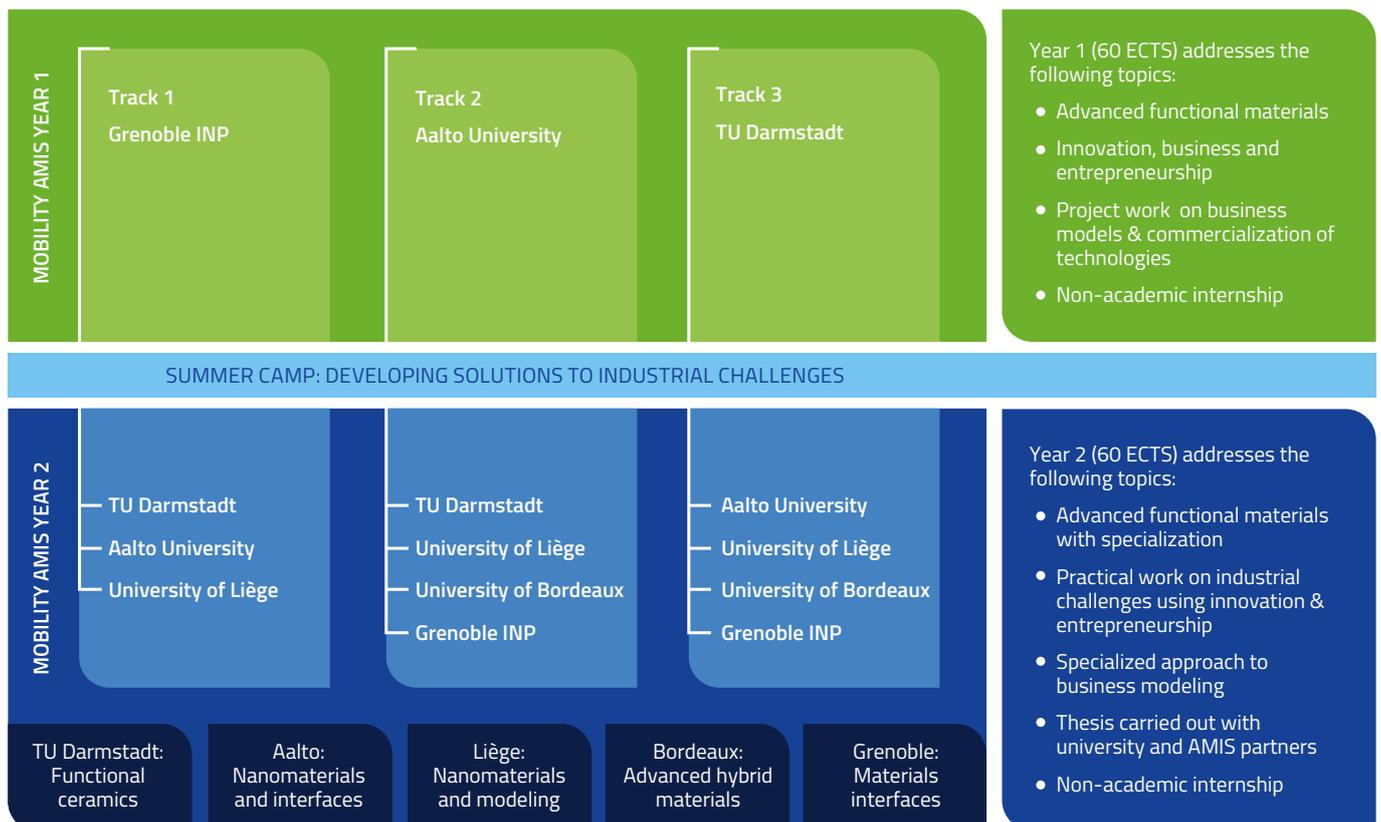
AMIS aims to train T-shaped professionals - experts in a particular raw materials discipline with an overview of the entire raw materials value chain. T-shaped professionals also work closely with industry to explore how innovation and entrepreneurship can strengthen the market uptake of raw materials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

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 specialization year and takes place at one of the five consortium partner universities. Year 2 includes mandatory courses in Advanced Functional Materials with a specialization in materials interfaces, nanomaterials, ceramics 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.

Innovation & 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 commercialization process of new technologies.
- The one-week intensive Summer Camp 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 organization developing a solution-focused approach by translating innovations into feasible business solutions and the commercialization 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 organizations, 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.

Professional profiles after graduation

The skills and knowledge AMIS alumni will develop 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, environment. As a resource engineer, potential career paths include:

Academic career/research: at universities, research institutions, teaching students or in a managerial position. Scientists with high commercialization awareness, knowledge, and competences; someone who can effectively communicate the commercial value of their scientific research.

Resource industry: SMEs in chemistry, exploration, green energy, machinery and plant construction, 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: create your own business or become a consultant.

Wider society: science journalism, consulting, project development and management, advisor to policy makers, administration, specialist agencies, media 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?
- Motivated to find real solutions to environmental and societal challenges?
- Interested in hands-on learning in industry and research companies?

For more information:

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EMC European Mining Course

Awarded the EIT Label in 2017

Diploma	Master of Science - Joint Triple Degree from Delft University of Technology, RWTH Aachen University and Aalto University - EIT Label Certificate
Credits	120 ECTS, 24 months
Language of Instruction	English
Starts in	September
Requirements	A Bachelor degree of at least 180 ECTS in appropriate subject areas (e. g. engineering, earth sciences, environmental sciences, mineral resources engineering) issued by one of the Partner Universities; or BSc Degree or a Bachelor degree of at least 180 ECTS credit points or an equivalent university qualification from other top universities worldwide in appropriate subject areas as mentioned above
Fees	EU/EFTA students: 2.006€/year Non EU/EFTA students: 15.166€/year
Application Period	01 October 2017 – 01 March 2018
Scholarships	For students beginning in September 2018, EIT scholarships up to EUR 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 scholarships will be awarded and who is eligible, please contact the coordinating university directly: info@emmep.org

Participating Universities

- RWTH Aachen University, Institute of Mineral Resources Engineering - Germany
- Aalto University, School of Engineering and School of Chemical Technology - Finland
- Delft University of Technology, Department of Geoscience and Engineering - Netherlands

The Challenge

With a growing world population and increasing global welfare, the demand for most metals and minerals is increasing. At the same time, metal and material markets are not always predictable and ore grades are decreasing over time, making the challenge to identify and extract resources within economies of scale even more complex. Adding to this complexity, awareness of environmental issues is also growing and the world expects resources to be extracted in a responsible manner. It will be up to the mining engineer of the future to operate successfully in this challenging environment.

Due to the rapid evolution of the raw materials sector, mining engineers today are expected to have command of vital innovation and entrepreneurial competences and skills with a deep understanding of sustainability. The exposure to internationally- and culturally-diverse environments has also become an appealing and desired quality, as globalization is increasingly relevant in all industries, including the mining sector and its extensive supply chains.

European Mining Course (EMC): Mining engineers of the future

The Joint Master European Mining Course (EMC) covers every aspect of the life cycle of mineral resources. It is a

Master programme designed to provide a solid understanding of the global mining industry and takes a life-cycle approach by covering the entire mining value chain. It offers a state-of-the-art technical basis in resource modelling, mine design and economic evaluation. Technical knowledge is also supplemented with topics on business economics, ethics, environmental engineering, and a clearly defined and structured programme for the management of health, safety and environment.

EMC aims to train professionals who will be the future decision-makers and game-changers in the mineral resources and associated engineering trade, with a strong vision of the future developments in this industry. EMC supports the development of students into adaptive, innovative and entrepreneurial-oriented engineers capable of identifying the best approach to obtain optimal value from mineral ore deposits.

Programme Structure

EMC is a two-year programme. Students study for one semester at each of the three universities and move between countries as a group.

Semester 1	Semester 2	Semester 3	Semester 4
Aalto University	RWTH Aachen University	TU Delft	Thesis
<ul style="list-style-type: none"> Fundamentals of minerals engineering and recycling (5 ECTS)* Technical Innovation Project (10 ECTS)* Economic Geology & Mineral economics (5 ECTS) Rock Mechanics (5 ECTS) Field experience and Project in Hard Rock Mining (5 ECTS) *Component of the Circular Economy Design Forum 	<ul style="list-style-type: none"> Feasibility Studies, Project Management and Financial Modelling (5 ECTS) Reserve Modeling and Estimation (4 ECTS) Underground Mine Design (4 ECTS) Surface Mine Design (4 ECTS) Mine Ventilation (6 ECTS) Case Study (7 ECTS) 	<ul style="list-style-type: none"> Data analysis and Resource Modeling (5 ECTS) Computer-aided mine design and optimization (5 ECTS) Legal, Health and Safety (5 ECTS) Financial Engineering and Investment Scenarios (5 ECTS) Project Execution/Mine Start-up Planning (10 ECTS) 	<ul style="list-style-type: none"> Thesis carried out at a company with support from EMC and EIT RawMaterials (30 ECTS)

The 120 credit points (ECTS) programme starts in the autumn at Aalto University (Finland). After a break, during which students have the opportunity to complete an internship at a company, students move to RWTH Aachen University (Germany) and finally they continue the third semester at TU Delft (the Netherlands). The final semester is spent at one of the three Partner Universities to work on a thesis project, which is carried out in cooperation with a company. Upon completion students receive a triple degree diploma from each of the three participating universities.

Innovation and Entrepreneurship Training

EMC aims to graduate adaptive, innovative and entrepreneurial-oriented engineers. To that end, innovation and entrepreneurship is embedded throughout the programme in the form of course content, case studies, project work, field trips, and professional contacts and support. Some examples include:

- Courses designed to promote the development of an entrepreneurial mind-set of students and the understanding of circular economy, supported by the “Circular Economy Design Forum”, an EIT RawMaterials project, taking place during semester 1 at Aalto University.
- Aalto University courses examining the way companies deal with technical challenges in a business environment, including observing how these are experienced hands-on during the “Field Experience and Project in Hard Rock Mining”, which consists of a one-week excursion to different mining operations and equipment manufacturers in Finland.
- All EMC students are introduced to YES!Delft, one of the top tech incubators in Europe. The programmes at the YESDelft! Incubator focus on validating and growing promising technologies into successful enterprises.
- At TU Delft, there are courses on financing mining projects, business modelling, implementation of optimization strategies to improve business cases, while at the same time considering the socio-environmental impacts of an optimization solution.
- Lectures involving industry, study tours and site visits to business partners to see real-world operations. Students will also be given the opportunity to obtain

industrial internship placements at an EMC programme partner company. Moreover, students are encouraged to carry out their thesis project in cooperation with a company. The process of forging a thesis together enforces your ability to learn and think as an entrepreneur.

Professional profiles after graduation

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

- Mining companies and companies engaged in minerals and metals processing technology
- Companies working on ore deposits and integrated production
- Market leaders in efficient dredging and mining
- Aggregates companies
- Government agencies
- Engineering and consulting firms
- Knowledge institutions and 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.

Are you a student who is

- Interested in taking a life-cycle approach to mining solutions?
- Keen to learn vital innovation and entrepreneurial skills that will help you start your own company?
- Motivated to work closely with industry, SMEs and start-ups at three different top universities?

For more information:

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EMerald Master in Georesources Engineering (focus in geometallurgy)

Awarded the EIT Label in 2016

Diploma	A joint triple degree is awarded by the EMerald universities Ingénieur Civil des mines et Géologue, University of Liège Master en "Géosciences: planètes, ressources, environnement", University of Lorraine Master of Science: major Geosciences, Lulea University of Technology - 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 of 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	4.000€/year for EU students 8.000€/year for non-EU students
Application Period	16 October 2017 - 30 June 2018 for EU students 16 October 2017 to mid-April 2018 for non-EU students
Scholarships	For students beginning in September 2018, EIT scholarships up to EUR 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 scholarships will be awarded and who is eligible, please contact the coordinating university directly: www.emerald.ulg.ac.be/ Additionally, non-Erasmus Mundus scholarship holders can apply for a tuition fee waiver.

Participating Universities

- University of Liège - Belgium
- University of Lorraine, ENSG Nancy - France
- Technische Universität Bergakademie Freiberg - Germany

The Challenge

The future and sustainability of our societies is critically linked to the exploitation of primary raw materials. The need for innovation in this sector is considerable as new deposits will be more and more difficult to process, due to their lower quality and the increasing regulations to minimize their impacts on the environment. Such innovations are only possible if a deep understanding of the geology is integrated throughout the whole mine lifecycle, from mining to site rehabilitation. Innovation requires a geometallurgical approach.

Geometallurgy aims at integrating geological characteristics into new resource-efficiency based models. It requires a deep understanding of geology and advanced mineral processing techniques, expertise in geo-modelling, knowledge of state-of-the-art monitoring tools, and an acute awareness of the environmental, economic and societal issues in mining.

EMerald: The next wave of resources game-changers

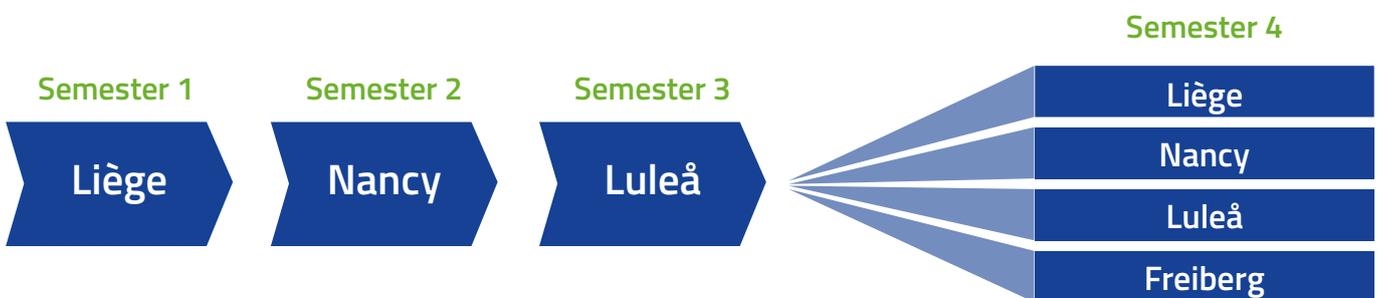
EMerald integrates knowledge of mineral/metal resources and modern engineering technologies to meet this challenge. This two-year Master programme draws from four top level engineering schools with a long tradition in the fields of geology, geo-modelling and mineral processing.

EMerald is a unique and innovative programme that ensures your training meets the exact expectations of worldwide industrials in the field of georesources. The programme is designed to focus on the following major aspects of georesources engineering: characterisation, processing, modelling and management. EMerald aims to focus on industrial needs, bridge the gap between georesources and advanced processing technologies, promote effective and environmentally friendly management, and give you an in-depth knowledge of mineral resources, co-products and the most recent and modern processing techniques.

Programme Structure

EMerald is organised in 4 semesters and accounts for 120 ECTS or 30 ECTS per semester.

All students complete their first semester in Liège, before moving to Nancy for Semester 2 and Luleå for Semester 3. The final semester can be spent at Liège, Nancy, Luleå or Freiberg depending on your thesis specialization. You have the opportunity to study and complete a Master thesis project in any of these institutions. Regardless of location, your Master thesis will be completed in close collaboration with an industrial partner or a research centre.



Innovation & 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 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. <http://e-sga.org/meetings/sga-biennial-meetings>), 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.

The EMerald programme also offers students the Winter Business School, which is a 3-week intensive course which takes place in Freiberg or in Liège prior to the fourth semester. During these 3 weeks, as an EMerald student, you will get the opportunity to take solid management courses in finance, marketing, business modeling and operations management, providing you 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 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.

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 at least 3 different European universities?

For more information:

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SINReM

Master in Sustainable and Innovative Natural Resource Management

Awarded the EIT Label in 2017

Diploma	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
Credits	120 ECTS, 24 months
Language of Instruction	English
Starts in	September
Requirements	<p>A Bachelor 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 recognized university or engineering college.</p> <p>Proof of proficiency in English – for detailed requirements, please visit the programme website: sinrem.eu/admission/</p>
Fees	<p>European (EEA): 6.000€/year All others: 12.000€/year</p>
Application Period	<p>European (EEA): until 31 May 2018 Non-European: until 28 February 2018</p>
Scholarships	<p>For students beginning in September 2018, EIT scholarships up to EUR 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 scholarships will be awarded and who is eligible, please contact the coordinating university directly: sinrem@ugent.be</p> <p>In addition to EIT scholarships, European students can apply for a (partial) tuition fee waiver.</p>

Participating Universities

- Ghent University - Belgium
- TU Freiberg - Germany
- Uppsala University - Sweden

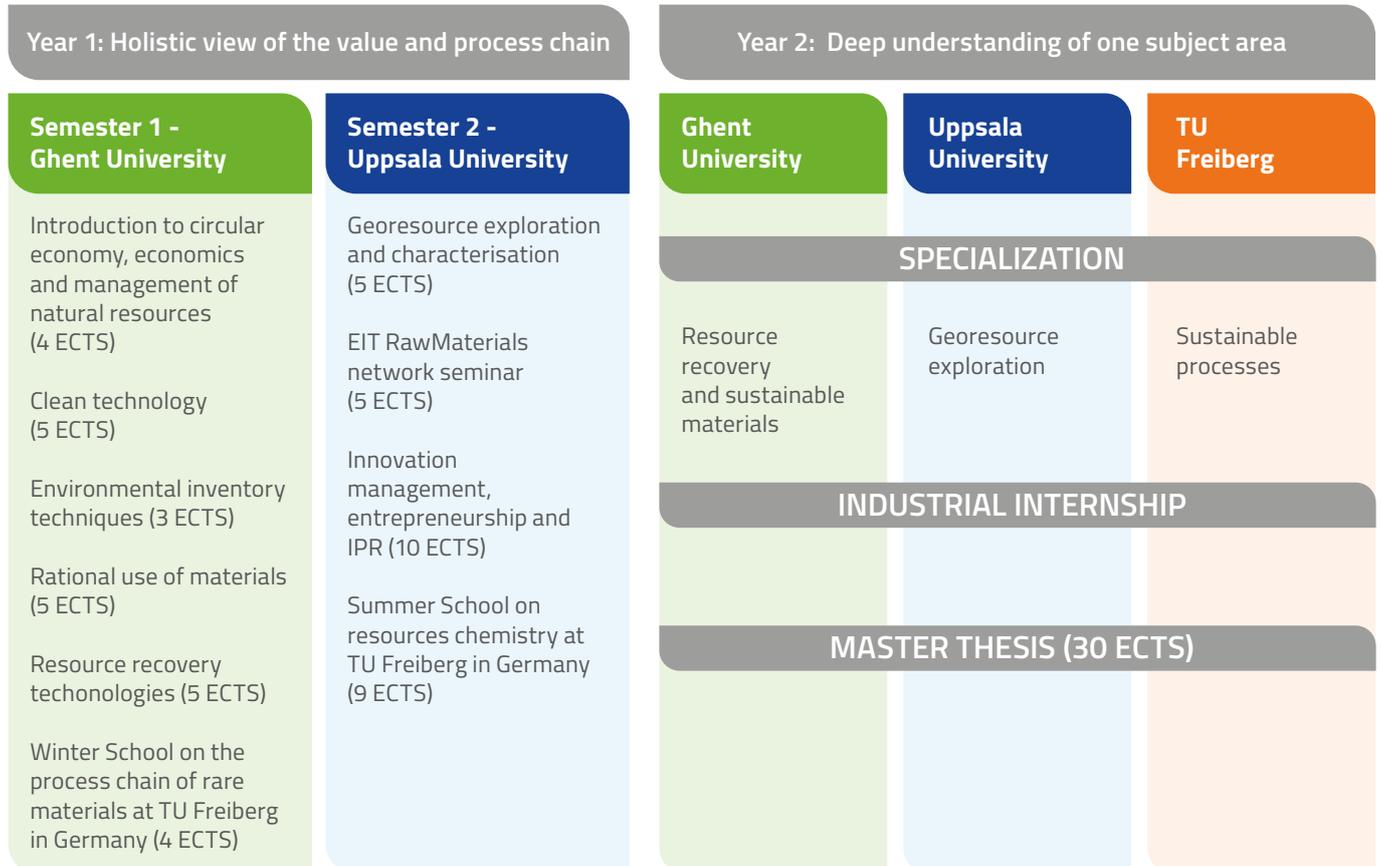
The Challenge

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 are vital for a decarbonizing society, renewable energy infrastructure, electric mobility but 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 universities cooperated to develop a new Erasmus+ Master 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, gain competence, expertise and confidence in developing solutions in the sustainable use of materials.

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 optimizing 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 and sustainably assess how to manage the Earth's resources. Students will instigate a paradigm shift in the industry by developing a holistic view on raw materials processing.



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 and integrating 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 language courses, a course on innovation management, IPR and entrepreneurship and a course Project Management and Business Plan Development that prepares the students for their Master thesis research and for the start of a future start-up or spin-off.

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 bring the results of research into application. Industrial partners and the research transfer/business development departments of the three partner universities are also there to support you.

Work in 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.

Are you a student who is

- Interested in exploring how to engineer technologies to improve the use of finite raw materials?

- Keen to learn about how innovation and entrepreneurship competences and skills can position you to contribute both to current industries but also create your own start-up?
- Motivated to work closely with industry and research on developing science-based solutions to pressing challenges?

For more information:

Please find out more information on the SiNREM website: sinrem.eu as well as on the EACEA portal

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SUMA

Master in Sustainable Materials

Awarded the EIT Label in 2016

Diploma	<p>Dual Master of Science degree awarded from two of the following universities:</p> <ul style="list-style-type: none"> • KU Leuven • Montanuniversität Leoben • University of Trento • Grenoble INP • University of Milano-Bicocca <p>- EIT Label Certificate</p>
Credits	120 ECTS, 24 months
Language of Instruction	English
Starts in	September
Requirements	<p>Generally, all students should have: Bachelor of Science or Bachelor of Engineering (or equivalent), as well as proof of English language proficiency</p> <p>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.</p>
Fees	<p>Fees vary based on programme track and country of origin.</p> <p>Total fees for EEA students range from 77€ to 5.500€. Total fees for non-EEA students range from 600€ to 12.000€.</p>
Application Period	<p>Application for the SUMA programme is a multi-step process. Applicants should register on the SUMA website: www.master-suma.eu</p> <p>For information on the registration/application deadlines for the entry universities, please check the following:</p> <p>KU Leuven - www.kuleuven.be/english/application/instructions</p> <p>Montanuniversität Leoben - starter.unileoben.ac.at/en/3489/</p> <p>University of Trento – offertaformativa.unitn.it/en/lm/materials-and-production-engineering/applying</p> <p>University of Milano-Bicocca (UNIMIB) - www.unimib.it/go/45797/Home/English/MENU-DX/Prospective-Students/How-to-enroll</p>
Scholarships	<p>For students beginning in September 2018, EIT scholarships up to EUR 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 scholarships will be awarded and who is eligible, please contact the coordinating university directly: piet.wostyn@kuleuven.be</p>

Participating Universities

- KU Leuven - Belgium
- Montanuniversität Leoben - Austria
- University of Trento - Italy
- Grenoble INP - France
- University of Milano-Bicocca- Italy

The Challenge

Materials provide the foundation of the modern global economy. Moreover, materials, many of them critical, are becoming increasingly relevant for the shift to a decarbonizing society as materials enable the transition to renewable energy, electric mobility, resource efficiency, among others. In order to ensure a future society is supplied with a sustainable stream of raw materials, robust solutions and game-changing technologies will be pivotal to ensuring material supply keeps pace with demand.

Sustainable material solutions with SUMA

The SUMA Master 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 mate-

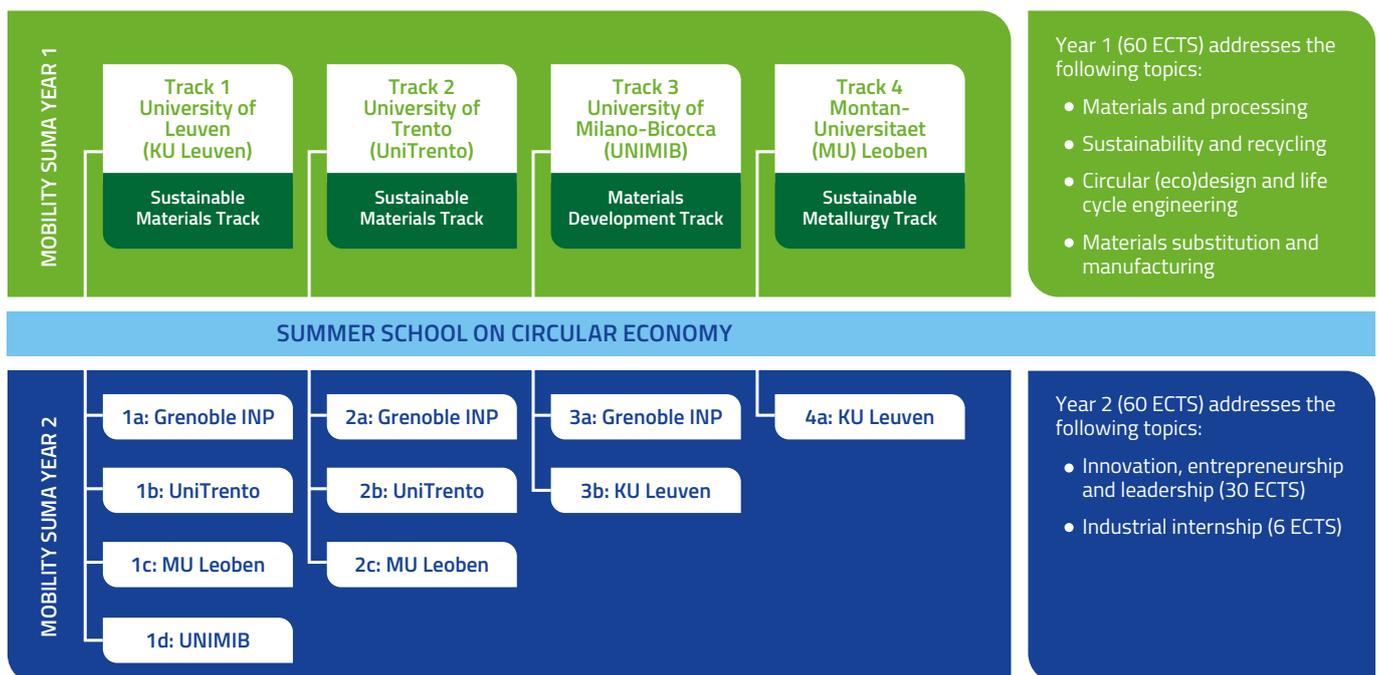
rial systems for specific functions, and with a specific view to the sustainability of processes and technologies in the field of material development. SUMA puts a particular strong focus on innovation, entrepreneurship and leadership and takes a holistic approach to the materials paradigm by exploring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

Programme Structure

The Sustainable Materials (SUMA) Master programmes are two year programmes embedded in the engineering programmes of the participating universities:

- KU Leuven - Master of Materials Engineering
- Montanuniversität Leoben - Master in Sustainable Materials
- University of Trento – Master in Materials and Production Engineering
- INP Grenoble – Master in Sustainable Industrial Engineering
- University of Milano-Bicocca (UNIMIB) – Master in Materials Science

There are in total 10 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.



Innovation and Entrepreneurship Training

As an EIT-labelled Master programme, SUMA recognizes 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 programmes organize 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 2017 edition took place in Leuven and discussed the topic of **'Digitizing the Circular Economy'** where students learned how Internet of Things (IoT), big data analysis and Industry 4.0 principles can be applied to sustainable materials processing. The 2017 SUMA Summer School enabled students to take a systems approach by exploring how Circular Economy Engineering is essential for sustainable process metallurgy, recycling and design for recycling.

Professional profiles after graduation

The SUMA Master 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.

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?

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EIT RawMaterials and the EIT Label

Introduction to the EIT-Labelled Master Programmes