



UNIVERSITY
OF BORÅS

PACE:
100 % full-time studies

LOCATION:
Campus in Borås

CREDITS:
120 ECTS credits

LANGUAGE:
English

APPLY AT:
universityadmissions.se

MORE INFORMATION:
Follow the QR code to learn more about prerequisites, tuition fees, course content, and more.



Resource Recovery – AI-Enhanced Supply Chain Management

MASTER'S PROGRAMME

This Master's programme consists of a unique combination of resource recovery and supply chain management, where we also take advantage of the growing opportunities available in AI. Resource recovery sees value in resources that are often otherwise seen as waste. A central component in creating resources from waste are efficient systems that can recover and transform waste into something of value. To enable this, as well as to reduce further waste generation, the management of supply chains is central. These subjects are closely connected, but often treated separately in different academic courses. Due to the high complexity in this area, there is great potential for improvement with the help of various decision supports.

Resource Recovery – AI-Enhanced Supply Chain Management

MASTER'S PROGRAMME

SUSTAINABLE DEVELOPMENT AND INCREASED COMPETITIVENESS

This Master's programme is for those who want to contribute to sustainable development by working within more stringent environmental and traceability requirements. The programme gives you knowledge about how companies increase their competitiveness through supply chain management. It will also prepare you to work with skills linked to the application of AI in order to understand and manage complex problems.

OUR PROGRAMME IN SHORT

You will study and practice how to manage supply chains across multiple industries in a sustainable way and you will learn how to analyse, describe, and design supply chains in relation to specific targets.

The programme also gives you insights into how AI and numerical methods contribute tools that are crucial in both research and practice within industrial engineering. These tools give you the possibility to understand, describe, and optimise supply chains.

PROGRAMME STRUCTURE

In the first term, you will acquire broad competencies regarding the present state and future directions of the field of resource recovery. The first term entails an exploration of methodological knowledge, including life cycle analysis and research methodology, and provides an overview of current regulatory frameworks, economic circumstances, and business models.

During the second term, the programme focuses on courses related to the sustainable management of supply chains in the textile and fashion industry, theory of logistics and supply chains, and the optimisation of complex systems. It also gives insights into AI and numerical methods within industrial engineering.

Lastly, the programme includes a year-long degree project yielding 60 ECTS credits, wherein you will investigate an area of your particular interest in depth. It is also possible to do a degree project yielding 30 ECTS credits by taking additional elective coursework relevant to the programme.



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Resource Recovery – Biotechnology and Bioeconomy

MASTER'S PROGRAMME

How can we produce enough nutritious food, animal feed, materials, and energy in a sustainable manner? How can biotechnology assist in fostering a sustainable society, and a circular economy, while creating job and business opportunities? This Master's programme offers the chance to become a global community builder in roles such as researcher, engineer, or manager.

Resource Recovery – Biotechnology and Bioeconomy

MASTER'S PROGRAMME

LEARN HOW TO TURN THE CHALLENGES OF WASTE INTO NEW OPPORTUNITIES

This unique Master's programme is for those who want to learn about how to use the biotechnology to turn the challenges associated with the huge amounts of waste generated by human activities into new opportunities for the development of a circular economy and society. It is for those who want to learn more about green solutions for waste management and how it is possible to convert waste and by-products into sustainable products, as well as for those who want to learn how biology and biotechnology are translated into practice in industry and trade.

OUR PROGRAMME IN SHORT

In this Master's programme, you will build your skills in analysing and solving problems related to the transport, processing, and transformation of waste streams and residues into useful products using biotechnological methods and you will learn how to develop related processes and business enterprises.

PROGRAMME STRUCTURE

In the first term, you will acquire broad competencies regarding the present state and future directions of the field of resource recovery on both a global and national scale. This entails an exploration of business insights and methodological knowledge, including life cycle analysis.

During the second term, the programme focuses on courses related to biotechnology applications, bioprocesses, and bioeconomy.

Lastly, the programme includes a year-long degree project yielding 60 ECTS credits, wherein you will investigate the area of your particular interest in depth. This degree project can be conducted either within the industry or in collaboration with our esteemed researchers and doctoral candidates at the Swedish Centre for Resource Recovery and the Swedish School of Textiles at the University of Borås. It is also possible to do a degree project yielding 30 ECTS credits by taking additional elective courses relevant to the programme.



SAMIRA SYED

"I wanted to learn skills that would let me make a real impact by finding practical ways to tackle environmental challenges and contribute to a better future for all."





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Resource Recovery – Polymer Materials for the Circular Economy

MASTER'S PROGRAMME

Polymer materials, including plastics and textiles, play a crucial role in our everyday lives. Therefore, the development of sustainable recycling methods and the creation of new polymer materials with minimal climate and environmental footprints are of utmost significance. If you aspire to explore this subject deeper and contribute to its progress, our Master's programme is designed specifically for you.

Resource Recovery – Polymer Materials for the Circular Economy

MASTER'S PROGRAMME

OUR PROGRAMME IN SHORT

Our programme focuses on polymer materials and their integration into a circular economy. It includes the concepts of polymer recycling, reuse, biodegradation, and their ecological impact. Additionally, it explores the development of renewable biopolymers and polymers that align with circular economy principles.

Within the programme, there is comprehensive coverage of the production, applications, and properties of plastics, textiles, and composite materials. Special attention is given to the potential of utilising biologically derived raw materials for polymer creation and their subsequent biological breakdown. Another focus is on the recycling of polymers as well as on the development of composites from natural fibres. The educational curriculum also incorporates the learning of practical laboratory methods to foster fundamental skills in the processing of plastics, composite manufacturing and structural characterisation, and material property testing.

RESEARCH IN RESOURCE RECOVERY AND TEXTILE TECHNOLOGY

As a student in this Master's programme, you will have the opportunity to engage in the forefront of the university's research activities

focussed on resource recovery and textile technology.

PROGRAMME STRUCTURE

In the first term, you will acquire broad competencies regarding the present state and future directions of the field of resource recovery on both a global and national scale. This entails an exploration of business insights and methodological knowledge, including life cycle analysis.

During the subsequent term, the programme places a specific emphasis on courses pertaining to polymer materials.

Lastly, the programme includes a year-long degree project yielding 60 ECTS credits, wherein you will investigate the area of your particular interest in depth. This degree project can be conducted either within the industry or in collaboration with our esteemed researchers and doctoral candidates at the Swedish Centre for Resource Recovery and the Swedish School of Textiles at the University of Borås. It is also possible to do a degree project yielding 30 ECTS credits by taking additional elective courses.



SNEHABEN GAURANGKUMAR MISTRY

"In the polymer programme, I learned so many things. Especially in plastic waste recycling. I also learned how we can produce bio-based polymers, or so-called sustainable polymers."





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Resource Recovery – Sustainable Civil Engineering

MASTER'S PROGRAMME

The building sector has a major impact on the climate and our environment. In this Master's programme, you will learn about how to create resource and energy-efficient buildings with good indoor environments. You will also immerse yourself in sustainable concrete and wooden constructions.

Resource Recovery – Sustainable Civil Engineering

MASTER'S PROGRAMME

THE FUTURE OF THE BUILDING SECTOR

This Master's programme is for those who want to contribute to a more sustainable building sector in the future. It is for those who want to tackle the challenges of reducing climate impact from the building sector by aiming for a higher degree of circularity, by creating new and smarter building materials and constructions, and by decreasing the energy use in buildings. The programme will prepare you to work with both management in the building sector, and with technology – in industry, in the public sector, and in research.

OUR PROGRAMME IN SHORT

You will study and practice problem solving, planning, leadership, and analytics with a focus on civil engineering, building technology, and a sustainable building sector. The programme deals with all parts of the lifespan of a building, from planning and construction, use of the building, to the end of its lifespan. You will explore the possibilities of circular design and the optimal use of building materials to decrease the impact of raw material extraction and waste.

PROGRAMME STRUCTURE

In the first term, you will acquire broad competencies regarding the present state and future directions of the field of resource

recovery. The first term entails an exploration of methodological knowledge, including life cycle analysis and research methodology, and provides an overview of current regulative frameworks, economic circumstances, and business models.

During the second term, the programme focuses on courses related to building technology and structural engineering. This includes building with renewable resources, such as wood, energy efficiency, recycling of building materials – in particular concrete, numerical methods, and computer-aided design.

Lastly, the programme includes a year-long degree project yielding 60 ECTS credits, wherein you will investigate an area of your particular interest in depth. This degree project can be conducted either within the industry or in collaboration with our researchers and doctoral candidates at the Swedish Centre for Resource Recovery at the Structural Mechanics and Building Physics Lab or at the Aggregate and Concrete Lab at the University of Borås. It is also possible to do a degree project yielding 30 ECTS credits by taking additional elective coursework relevant to the programme.



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Resource Recovery – Sustainable Energy Processes

MASTER'S PROGRAMME

Today, humans produce vast amounts of waste and other residual material; at the same time, the demand for products and energy is steadily increasing. This increase also applies to needs for nutrients and minerals that then often end up in landfills or the ocean. This Master's programme is for those who want to be a part of the important technological leap forwards towards a circular economy and a more sustainable energy system, either as a researcher, an engineer, or within management.

Resource Recovery – Sustainable Energy Processes

MASTER'S PROGRAMME

OUR PROGRAMME IN SHORT

In this Master's programme, you will study the opportunities available regarding the utilisation of waste and residual material. Through thermal treatment methods, you will learn to create valuable and necessary products. It is possible, for example, to produce energy carriers like electricity, heat, and fuels, and at the same time separate inorganic material and important metals for future use in society. This minimises the need for landfills. Your future role focuses on minimising human interference in the natural biosphere. More specifically, the studies include process technologies but also system analysis specifically dedicated to energy purposes.

PROGRAMME STRUCTURE

During the first term, you will gain an understanding of the current status and future trends in the field of resource recovery, both globally and nationally. Business and methodological knowledge such as life cycle

analysis are also included. The second term focuses on courses in energy recovery, thermal processes, and sustainable energy systems.

The programme ends with a one-year degree project in which you will immerse yourself further in the area that interests you. The degree project can be carried out within the industry or in collaboration with our researchers and doctoral students at the Swedish Centre for Resource Recovery at the University of Borås.



ONYINYECHI UGOCHUKWU

"It is a very versatile programme and there is no restriction to any area you would want to venture into in the future."



Overview of Resource Recovery Programmes

AI-Enhanced Supply Chain Management

Courses

Courses, year 1:

- Resource Recovery 1, 7.5 ECTS credits
- Life Cycle Assessment, 5 ECTS credits
- Theory of Science and Research Methodology, 5 ECTS credits
- Resource Recovery 2, 7.5 ECTS credits
- Circular Economy, 5 ECTS credits
- Sustainable Supply Chain Management in Apparel and Textiles, 7.5 ECTS credits
- Stochastic Optimisation of Complex Systems, 7.5 ECTS credits
- Advanced Supply Chain Management, 7.5 ECTS credits
- AI in Industrial Processes and Supply Chains, 7.5 ECTS credits

Biotechnology and Bioeconomy

Courses, year 1:

- Resource Recovery 1, 7.5 ECTS credits
- Life Cycle Assessment, 5 ECTS credits
- Theory of Science and Research Methodology, 5 ECTS credits
- Resource Recovery 2, 7.5 ECTS credits
- Circular Economy, 5 ECTS credits
- Industrial Biotechnology, 7.5 ECTS credits
- Biotechnology Processes and Applications, 7.5 ECTS credits
- Bioprocess Design, 15 ECTS credits

Polymer materials for a circular economy

Courses, year 1:

- Resource Recovery 1, 7.5 ECTS credits
- Life Cycle Assessment, 5 ECTS credits
- Theory of Science and Research Methodology, 5 ECTS credits
- Resource Recovery 2, 7.5 ECTS credits
- Circular Economy, 5 ECTS credits
- Polymer Technology, 7.5 ECTS credits
- Polymers and Textiles in Composites, 7.5 ECTS credits
- Experimental Methods for Polymers and Textiles, 7.5 ECTS credits
- Polymeric and Textile Materials and the Environment, 7.5 ECTS credits

Sustainable Civil Engineering

Courses

Courses, year 1:

- Resource Recovery 1, 7.5 ECTS credits
- Life Cycle Assessment, 5 ECTS credits
- Theory of Science and Research Methodology, 5 ECTS credits
- Resource Recovery 2, 7.5 ECTS credits
- Circular Economy, 5 ECTS credits
- The building as a system, 7.5 ECTS credits
- Timber technology, 7.5 ECTS credits
- Digitalisation and mathematical modelling, 15 ECTS credits
- Concrete technology and recycling, 7.5 ECTS credits

Sustainable Energy Processes

Courses, year 1:

- Resource Recovery 1, 7.5 ECTS credits
- Life Cycle Assessment, 5 ECTS credits
- Theory of Science and Research Methodology, 5 ECTS credits
- Resource Recovery 2, 7.5 ECTS credits
- Circular Economy, 5 ECTS credits
- Thermal Energy Recovery, 7.5 ECTS credits
- Heat Transfer in Thermal Applications, 7.5 ECTS credits
- Process Design - Energy Carrier Production, 15.0 ECTS credits

Courses, year 2:

Terms 3 and 4 consists only of a degree project, divided into two courses: Degree project 1, 30 ECTS credits and Degree project 2, 30 ECTS credits. In Degree project 2, the research project is further specialised.

During year 2, there is an opportunity for students to exchange the course Degree project 2 for courses comprising 30 ECTS credits.

The intention is to facilitate various forms of internationalisation, such as exchange studies. The courses are to be linked to the objectives of the programme.



Resource Recovery – AI-Enhanced Supply Chain Management

Prerequisites

Bachelor of Science in Engineering or a Bachelor of Engineering, 180 ECTS credits, with a focus on industrial economics or textile management, or a bachelor's degree in physics or chemistry. Alternatively, a related education with a focus on logistics (15 ECTS credits) and industrial economics (15 ECTS credits).

- English 6 is required.

Resource Recovery – Biotechnology and Bioeconomy

Bachelor's degree of 180 ECTS credits in:

- Science or Science in Engineering specialising in
- mechanical engineering
- industrial economics
- energy engineering
- chemical engineering
- biotechnology
- road and water technology
- textile engineering, or construction engineering
- or a Bachelor's degree in physics or chemistry.

- English 6 is required.

Resource Recovery – Polymer materials for a circular economy

Bachelor's degree of 180 ECTS credits in:

- Science or Science in Engineering Specialising in
- mechanical engineering
- industrial economics
- energy engineering
- chemical engineering
- polymer technologies
- materials engineering
- biotechnology
- road and water technology
- textile engineering, or construction engineering
- or a Bachelor's degree in physics or chemistry.

- English 6 is required.

Resource Recovery – Sustainable Civil Engineering

Prerequisites

Bachelor's degree of 180 ECTS credits in:

- Science of Science Engineering, of which 60 credits in construction or building technology related topics specialising in
- business development in construction
- construction engineering
- energy technology
- materials technology
- civil engineering
- or equivalent.

- English 6 is required.

Resource Recovery – Sustainable Energy Processes

Bachelor's degree of 180 ECTS credits in:

- Science or Science in Engineering specialising in
- mechanical engineering
- industrial economics
- energy engineering
- chemical engineering
- biotechnology
- road and water technology
- textile engineering, or construction engineering
- or a Bachelor's degree in physics or chemistry

- Knowledge of thermodynamics

- English 6 is required.

Career opportunities

This educational programme gives you broad competence that prepares you for professional roles linked to supply chains, product development, and sustainability issues at manufacturing or transport companies.

The programme will also make you a global community builder with the knowledge necessary to take on challenges and to set up professional networks in the area of sustainable supply chain management.

This educational programme prepares you for professional roles as an engineer, product developer, researcher, or manager, where you need knowledge in biotechnology and process development in a circular bioeconomy.

The programme will also make you a global community builder with the knowledge necessary to take on challenges and to set up professional networks in biotechnology and circular bioeconomy.

This educational programme prepares you for professional roles as an engineer, product developer, researcher or manager, where you need knowledge regarding how polymer based materials act in the circular economy as well as the bioeconomy.

The programme will also make you a global community builder with the knowledge necessary to take on challenges and to set up professional networks in the area of polymers and the society.

Career opportunities

This educational programme prepares you for professional roles as a structural engineer, construction manager, sustainability expert, property developer, researcher or developer in the construction sector with a focus on sustainability.

The programme will also make you a global community builder with the knowledge necessary to take on challenges and to set up professional networks in the area of sustainable construction.

Possible places of employment after graduation are energy companies, consulting companies, research institutes, recycling companies, manufacturers of equipment, public administration, and other industries.

You can work with product or process development or as an environmental manager at a company. Of course, you also have the opportunity to later pursue doctoral studies in the field, in Sweden or abroad.

How to apply

Step 1:

Complete the formal application on the national website: www.universityadmissions.se

Read more about the application and admission process:



Spring and autumn intake!

