KU LEUVEN



Postgraduate Certificate:

Sustainable polymers in a circular economy

Circular design, application and (re)processing of sustainable polymer materials and products

postuniversitair centrum

Why this programme?

Does your organisation want to take the leap to a future-proof circular (bio)polymer value chain, but do you lack sufficient knowledge and skills on how to get started or scale up?

The need for a sustainable transformation of our economy and society as a whole has gained more widespread acceptance in recent years thanks to new scientific insights and the ever increasing prominent (consequences of) climate change. Moreover, multiple geo-political events made the urge for fundamental transitions in sustainable raw material management, food and energy supply clearly tangible. Sustainability is or should be high on the agenda of every organisation. Sustainable products, processes and services evolve into the new mainstream.

A circular use of products and materials, fostering resource efficiency and minimising waste, is vital in the transition to a more sustainable, resilient economy, society and planet. This is especially true for the plastics industry, which is still mainly based on virgin, fossil fuel-based polymers. However, while plastics are often criticised for their environmental impact, they also offer opportunities to reducing greenhouse gas emission through e.g. decreasing food spoilage, performant lightweight solutions, recyclability, etc.

Increasing the circularity of plastic materials and products and the implementation of non-fossil based materials is hence the way forward for a sustainable polymer industry.

The Postgraduate Certificate **Sustainable polymers in a circular economy** has been designed specifically for you to acquire solid academic and applied interdisciplinary knowledge in the design, application, (re)processing, circular life cycle and sustainability assessment of sustainable polymer materials and products, as well as the different strategies, opportunities and challenges to establish and implement a circular business model.

This programme runs jointly with the postgraduate programme *Circular economy – business and legal frameworks and opportunities.*

Read more



WHAT'S IN IT FOR YOU?

- You gain **broad multidisciplinary insights** in the diverse perspectives of circular economy as well as their interdependencies and impacts: technical, economic, legal, political and societal.
- You are first in line to get to know the **most recent evolutions and developments** within the multiple circular economy expertise domains and in particular in the field of sustainable polymer materials and products from a team of lecturers from both **academia and industry**.
- You acquire expert knowledge in design for circularity, novel circular (bio)materials and how to process them, advanced material characterisation, and recycling processes and techniques.
- You learn how to assess the circularity and sustainability of polymer materials and products. You get acquainted with different methods and tools as well as the limits of available data and assumptions.
- Practical knowledge is facilitated through **company visits and workshops**.
- You are challenged to address the development or evaluation of a circular material or product from the principle of **systems thinking**, considering the entire value chain and all stakeholders.
- You learn how to **implement** new circular strategies or solutions in your organisation.
- You are able to make informed decisions and **define well-considered solutions** for the circular business challenges in your own practice.
- You **enlarge your professional network** through interaction with fellow participants from different sectors and with the teachers from both academia and industry.

For whom?

The programme aims at professionals within the polymer processing industry seeking to expand their knowledge of the different perspectives of circular economy in general and its application to sustainable polymer materials and products in particular.

Sustainability transitions require a holistic approach where solving these ‘wicked problems’ must be tackled from a systems perspective to achieve a global positive impact. This specialised programme offers a balanced, interdisciplinary content appealing to different technical profiles active in polymer processing.

The programme specifically caters to participants with a certain degree of decision-making power within their organisation to actively contribute to the transition to a circular economy, including but not limited to:
R&D manager, R&D engineer, innovation manager, product manager, product developer, material developer, project manager, project engineer, operations manager, process manager, process engineer, etc.

In general, participants with a master’s degree and 3-5 years’ experience will be admitted. A background (through education or experience) in polymer science is required. If you hold a bachelor’s degree or recently graduated as a master, you are also welcome to the programme through submitting your CV and motivation letter to demonstrate you have the necessary background. The programme committee will assess your application.



PROGRAMME STRUCTURE

The programme consists of 2 modules and a closing thesis (paper), integrating the knowledge acquired in the different courses.

MODULE 1: A HOLISTIC VIEW ON CIRCULAR ECONOMY

This module offers a broad, multidisciplinary perspective on circular economy. It starts with a general introduction to circular economy as a means to achieve sustainability goals, followed by several chapters each addressing a specific aspect of circular economy, i.e. business-economic, legal, policy, social, and technical.

WHAT IS CIRCULAR ECONOMY?

- Why circular economy?
- Circular economy vs. sustainability
- Circular/system thinking
- How to transition towards a circular economy?

BUSINESS ECONOMIC ASPECTS OF CIRCULAR ECONOMY

- Circular business models
- Circular corporate models
- Circular procurement
- Corporate identity and culture; change management
- Circular business development
- Corporate communication on sustainability

LEGAL ASPECTS OF CIRCULAR ECONOMY

- European and (inter)national legislative and standardization frameworks
- Contractual opportunities and challenges in circular business models

POLICY AND SOCIO-ECONOMIC ASPECTS

- Circular economy policy
- Consumer readiness for circular economy
- Impact of circular economy on the labour market
- Social impact of circular economy (just transition)

HOW TO MONITOR THE CIRCULAR ECONOMY?

- Indicators of circularity
- Impact measurement of circularity
- Digital technologies as enabler for a circular economy

CIRCULAR MATERIALS AND PRODUCTS

- Sustainable (raw) materials
- Circularity of materials
- Bio-based and biodegradable polymer materials

MODULE 2: SUSTAINABLE POLYMER MATERIALS AND PRODUCTS

This module offers in-dept knowledge through specialised courses in the design, application, (re)processing, circular life cycle and sustainability assessment in the particular field of sustainable polymer materials and products.

DESIGN FOR CIRCULARITY

- Concept
- Design rules
- Design evaluation
- Design checklists

SUSTAINABLE POLYMERS

- Sustainable and circular polymer materials: state of the art
- Opportunities and limits for processing and performance
- Material characterisation
- Material connectivity (interface interactions, sustainable glues)

RECYCLING

- Legislative framework
- Recycling techniques

PROCESSING OF SUSTAINABLE POLYMERS

- Material processing and performance in practice
- Industrial characterisation tools
- Numerical simulations

SUSTAINABILITY ANALYSIS OF MATERIALS AND PRODUCTS

- Principles and methods
- Certification of recycled material

Programme subject to approval by the Academic Board.

Get to know the lecturers

EVALUATION AND CERTIFICATE

The evaluation will be based on your active participation during the sessions and (group) exercises as well as on your thesis (in Dutch or English) and your presentation of it to the examination jury.

Upon successful completion of the programme, you receive the Postgraduate Certificate: *Sustainable polymers in a circular economy*, awarded by KU Leuven. The programme contains 21 ECTS.

PROGRAMME COMMITTEE

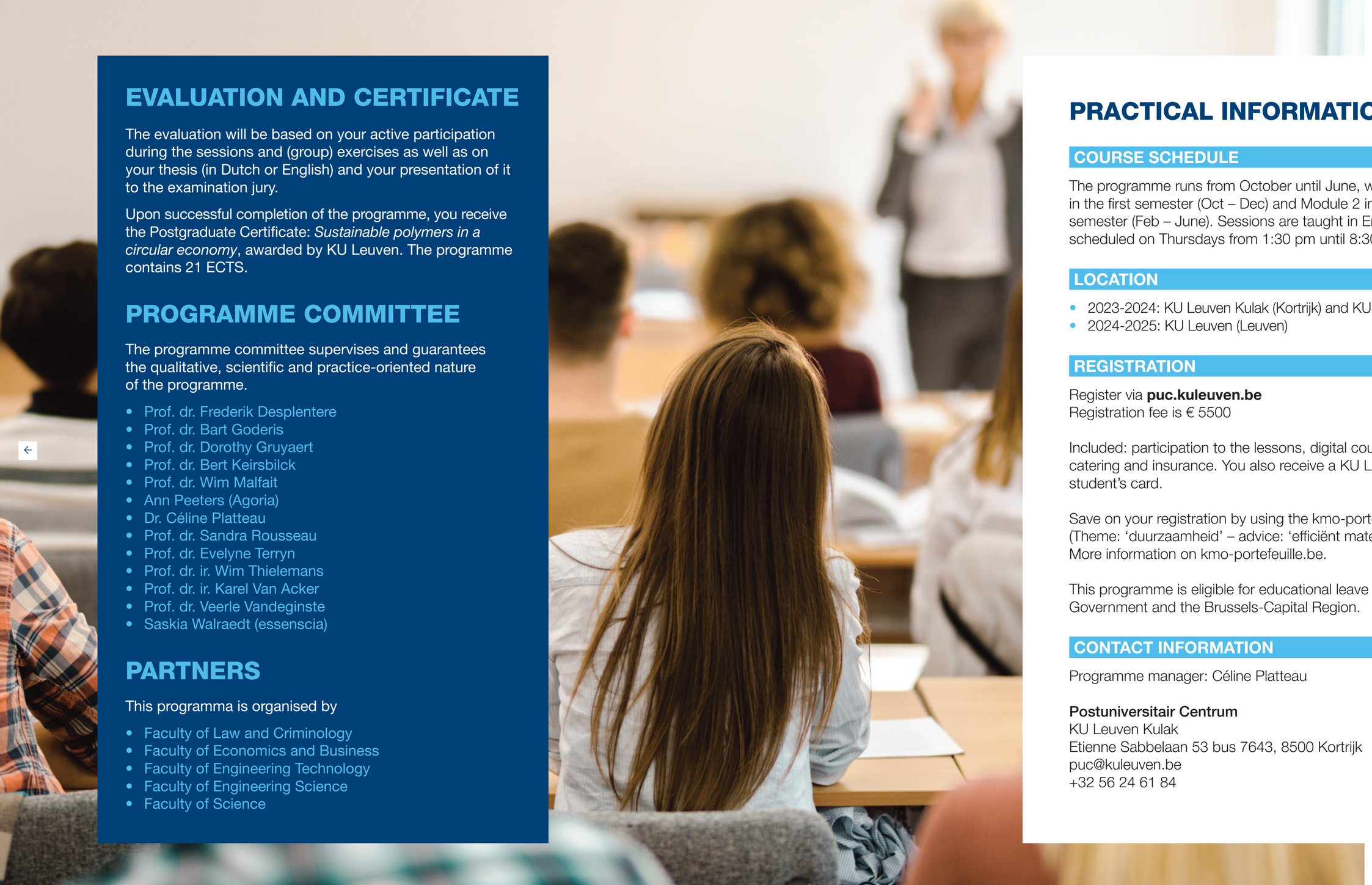
The programme committee supervises and guarantees the qualitative, scientific and practice-oriented nature of the programme.

- Prof. dr. Frederik Desplentere
- Prof. dr. Bart Goderis
- Prof. dr. Dorothy Gruyaert
- Prof. dr. Bert Keirsbilck
- Prof. dr. Wim Malfait
- Ann Peeters (Agoria)
- Dr. Céline Platteau
- Prof. dr. Sandra Rousseau
- Prof. dr. Evelyne Terryn
- Prof. dr. ir. Wim Thielemans
- Prof. dr. ir. Karel Van Acker
- Prof. dr. Veerle Vandeginste
- Saskia Walraedt (essenscia)

PARTNERS

This programma is organised by

- Faculty of Law and Criminology
- Faculty of Economics and Business
- Faculty of Engineering Technology
- Faculty of Engineering Science
- Faculty of Science



PRACTICAL INFORMATION

COURSE SCHEDULE

The programme runs from October until June, with Module 1 in the first semester (Oct – Dec) and Module 2 in the second semester (Feb – June). Sessions are taught in English and scheduled on Thursdays from 1:30 pm until 8:30 pm.

LOCATION

- 2023-2024: KU Leuven Kulak (Kortrijk) and KU Leuven - Brugge
- 2024-2025: KU Leuven (Leuven)

REGISTRATION

Register via **puc.kuleuven.be**
Registration fee is € 5500

Included: participation to the lessons, digital course material, catering and insurance. You also receive a KU Leuven student's card.

Save on your registration by using the kmo-portefeuille (Theme: 'duurzaamheid' – advice: 'efficiënt materiaal gebruik'). More information on kmo-portefeuille.be.

This programme is eligible for educational leave by the Flemish Government and the Brussels-Capital Region.

CONTACT INFORMATION

Programme manager: Céline Platteau

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