Venue: Ghent

Ghent is a city and a municipality in the Flemish Region of Belgium. It is the capital and largest city of the province of East Flanders, and the third largest in the country. It flourishes thanks to being a port and university city. It is well known for its architecture, among other the St. Bavo's Cathedral and the Gravensteen castle, museums and restaurants serving typical Ghent food. Annually the Ghent Festival (Gentse Feesten) is held since 1969. It lasts for ten days and attracts more than 1 million visitors each year. The next edition takes place from Friday 18th of July until Sunday 27th of July 2025, i.e., starting the evening of the last day of the course!

Meet the tutors

Joris W. Thybaut is senior full professor in catalytic reaction engineering at the Laboratory for Chemical Technology (LCT) at Ghent University since October 2014. He obtained his PhD on single-event microkinetic (SEMK) modelling of hydrocracking and hydrogenation and founded ShARP Engineering in 2017.

Jeroen Poissonnier is a Science Policy Coordinator at the Center for Sustainable Chemistry at Ghent University. He obtained his PhD in Chemical Engineering in 2018 on biomass valorization supported by multiscale modeling. He joined ShARP Engineering in 2019.

*More information on transport and hotel rooms is available on the website: http://sharpengineering.be/IUCK

interactive course

from Idea to Understanding Chemical Kinetics: simulating and modeling in Python

16th – 18th of July 2025
Ghent, Belgium

http://sharpengineering.be/IUCK

info@sharpengineering.be

Course Topic

Chemical reactors play a crucial role in industrial-scale, raw material conversion into products. Numerous factors must be considered when selecting an appropriate and efficient chemical reactor, in particular when complex heterogeneous reactions occur. Kinetic modelling is an essential tool for the design and optimization of chemical products and processes. It includes fundamental aspects such as stoichiometry, kinetics and thermodynamics in the analysis of chemical reactor behaviour. Microkinetic models help to consolidate the fundamental information about a catalytic reaction. Integrating such microkinetic models in industrial reactor models and in process simulators allows for coupling with e.g. utilities and separation units to design industrially relevant process concepts which allow thorough viability and techno-economic studies. During this course with a focus of chemical reaction and reactor engineering, ex-cathedra sessions are alternated with interactive tutorials during which Python is used. While datasets for the case study in the course will be provided, the participants are encouraged to bring and work with their own datasets and apply the knowledge to their own case studies.

This interactive course on chemical reaction and reactor engineering is organized by

      prof. dr. ir. Joris W. Thybaut

      dr. ir. Jeroen Poissonnier

and performed within the framework of the Horizon Europe projects e-CODUCT and eLECTRO.

Course Registration

This course is intended for (junior) **engineers and scientists from industry as well as academia with a background in chemistry or chemical engineering**. The course is intended for novices in the field as well as participants with prior knowledge. The **total number of participants is limited to 30** to maximise the benefit to the participants. The course fee is shown in the table below and **includes the course, course material, lunches, course dinner and coffee breaks** at the location.

	Early bird (till April 30th, 2025)	Regular (May 1st – June 30th 2025)
Students	**€550** (excl. VAT)	€700 (excl. VAT)
Academia	**€650** (excl. VAT)	€800 (excl. VAT)
Industry	**€750** (excl. VAT)	€1000 (excl. VAT)

Register via email to info@sharpengineering.be.

Course Programme

July 16th, 2025 (Wednesday)

Tutorial 0: Introduction to Python

Reactor types and their corresponding behaviour

Bench scale reactors

Tutorial I: Intrinsic kinetics verification

July 17th, 2025 (Thursday)

Lab-scale data acquisition

Tutorial II: Data analysis using Python

Rate equation derivation

Tutorial III: Rate equation derivation

July 18th, 2025 (Friday)

Regression analysis

Tutorial IV: model parameter estimation using Python and interpretation

Guided application to own case studies/data