

Course: Process Technology 2

credits: 5

Course code	CTVP23PROCES2	Modes of delivery	Lecture
Name	Process Technology 2		Practical / Training
Study year	2026-2027		Tutorial
ECTS credits	5	Assessments	Practicum - Other assessment
Language	Dutch, with parts in English		Proces Technologie 2 Theorie - Written, organised by STAD examinations
Coordinator	R.A. Knigge		

Learning outcomes

The Process Technology 2 curriculum component covers the following components of the Chemical Engineering BOKS:

Knowledge:

Thermodynamics: chemical thermodynamics (equilibria, enthalpy)

Statistics and mathematics: differential equations (numerical solving), data processing and data analysis (non-linear regression)

Process modelling: simulating and modelling reaction mechanisms and growth curves

Reactor science: kinetics (reaction mechanisms, catalysis, enzyme kinetics)

Materials science: material properties (plastics)

Chemistry: chemical equilibrium, basic polymer chemistry, basic biochemistry

Skills:

ICT skills: use and deployment of state-of-the-art digital tools/software (Excel, Mathcad, Minitab)

Social and communication skills: reporting and presenting

General laboratory skills and chemical analysis methods: laboratory-scale experimentation

Working safely in laboratory and industrial environments

This module has the following learning outcomes:

You describe the growth of microorganisms (prokaryotes) using the Gompertz equation and logistic growth.

You describe the location and shift of chemical equilibria based on calculated values of K_c and K_p and on the Chantelier-Van t'Hoff principle.

You calculate the reaction enthalpy of a reaction based on formation enthalpies of the substances in the reaction equation.

You communicate in writing according to the given guidelines (logbook instruction, template report, poster instruction) in Dutch about a simple(er) experiment/professional task.

You execute in a safe way an experiment in a chemical laboratory

Content

The basis of many chemical-technological processes is the chemical reaction. This module focuses on chemical equilibrium (K_c , K_p), reaction enthalpy, and reaction rate (kinetics). Kinetics are discussed for simple reactions, also for sequential reactions (polymers) and, in the case of low temperature, the use of a catalyst.

An introduction to biochemistry is also covered (DNA, RNA, fats, sugar, proteins, ADP/ATP) with the connection of catalysts in bacteria in the form of enzymes. Growth of bacteria/yeasts (Gompertz, logistic) is covered along with fitting growth data to models (Minitab) and calculating growth models (ODEs with Mathcad). Reaction kinetics using enzymes (Michaelis-Menten) is discussed.

and write a reflection on the obtained results.

You reflect on your functioning and professional development.

DAS competencies

Competency	Level (I-IV)
Research	1
Experimentation	1
Development	1
Management	
Advise	1
Instruction	1
Leadership	
Self-management	1

Included in programme(s)

Chemical Engineering

School(s)

Engineering, Life Sciences & ICT

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