Course Specifications
Valid as from the academic year 2019-2020

Balances of Biochemical and Chemical Processes (I700231)

Course
Lecturers in academic year 2019-2020
De Gelder, Leen
Verwaeren, Jan

LA25 lecturer-in-charge
LA26 co-lecturer

Course offerings and teaching methods in academic year 2019-2020
A (semester 2) Dutch

Contact hrs
12.0 h seminar: coached exercises
24.0 h exercises

Offered in the following programmes in 2019-2020
Bachelor of Science in Bioscience Engineering Technology

Contacts hrs
Study time 120 h
Credits 4.0

Teaching languages
Dutch

Keywords
Process balances, mass- and energy balances, steam

Position of the course
The main objective is for the students to acquire the skills to successfully analyse and solve quantitative problems regarding chemical and biochemical production processes. In the first part, the student gets acquainted with analysing mass streams of production processes in the application of mass balances. In the second part, energy balances are introduced through looking at processes that use steam.

Contents
Basics: quantities, units, fractions, chemical reaction nomenclature (stoichiometrics, limiting reactant, reactant in excess, selectivity, yield, degree of conversion)
Mass balances (total and partial); with mixing point, with mixing point and chemical reaction, with mixing and distribution point, regarding topics such as filtration, Kristillazation, microbiological hydrolysis, distillation, dewatering
Energy balances: heating (heat exchanger, steam injection), evaporation, drying through steam technology

Initial competences
General and anorganic chemistry I, organic chemistry

Final competences
1 Being able to analyse production systems through mass and energy balances.
2 Having insight in (bio)chemically industrially important unit operations.
3 Acquiring insight in parameters which influence system efficiency
4 Understanding a real life production process and being able to quantify its properties

Conditions for credit contract
Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract
This course unit cannot be taken via an exam contract

Teaching methods
Group work, seminar: coached exercises

(Approved)
Extra information on the teaching methods

Work college: students solve exercises with interaction amongst students and between students and professor, students are actively called upon to participate.

Guided independent work: Students describe a (bio)chemical production process, make a process schematic and simulate quantitatively the material streams within the process.

Learning materials and price

  Syllabus available

References


Course content-related study coaching

  During contact hours
  By appointment

Evaluation methods

  continuous assessment

Examination methods in case of periodic evaluation during the first examination period

Examination methods in case of periodic evaluation during the second examination period

Examination methods in case of permanent evaluation

  Written examination, participation, assignment

Possibilities of retake in case of permanent evaluation

  Examination during the second examination period is possible in modified form

Extra information on the examination methods

  Three written tests throughout the semester
  Participation during work colleges, solving extra problems
  Report on (bio)chemical process evaluation and quantification

Calculation of the examination mark

  Tests and participation: 80%
  Report: 20%