## Course Specifications

Valid as from the academic year 2018-2019

### Course

Process Engineering 2 (I000569)

### Course size

<table>
<thead>
<tr>
<th>Credits</th>
<th>Study time</th>
<th>Contact hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td>135 h</td>
<td>60.0 h</td>
</tr>
</tbody>
</table>

### Course offerings and teaching methods in academic year 2019-2020

**A (semester 1)**
- **Language**: Dutch
- **Teaching methods**:
  - Seminar: coached exercises: 11.25 h
  - Guided self-study: 6.25 h
  - Lecture: 18.75 h
  - Seminar: practical PC room classes: 18.75 h
  - Lecture: plenary exercises: 5.0 h

### Lecturers in academic year 2019-2020

- **Van der Meeren, Paul**
  - LA24 lecturer-in-charge
- **Dewulf, Jo**
  - LA24 co-lecturer

### Offered in the following programmes in 2019-2020

<table>
<thead>
<tr>
<th>Programme</th>
<th>Credits</th>
<th>Offering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master of Science in Bioinformatics (main subject Bioscience Engineering)</td>
<td>5</td>
<td>A</td>
</tr>
<tr>
<td>Master of Science in Chemical Engineering</td>
<td>5</td>
<td>A</td>
</tr>
<tr>
<td>Master of Science in Chemical Engineering</td>
<td>5</td>
<td>A</td>
</tr>
<tr>
<td>Master of Science in Bioscience Engineering: Cell and Gene Biotechnology</td>
<td>5</td>
<td>A</td>
</tr>
<tr>
<td>Master of Science in Bioscience Engineering: Chemistry and Bioprocess Technology</td>
<td>5</td>
<td>A</td>
</tr>
<tr>
<td>Master of Science in Bioscience Engineering: Food Science and Nutrition</td>
<td>5</td>
<td>A</td>
</tr>
<tr>
<td>Master of Science in Bioscience Engineering: Environmental Technology</td>
<td>5</td>
<td>A</td>
</tr>
</tbody>
</table>

### Teaching languages

- Dutch

### Keywords

- Unit operations

### Position of the course

This course is an extension of the course 'process engineering' that is taught in the bachelor degree. In the former course some unit operations have been addressed that are relevant for all Masters. Process engineering 2 deals with the unit operations that have not been dealt with in the Ba-level course and that are relevant for the Ma in Applied Biological Sciences.

### Contents

1. Particle size analysis
   - a) Equivalent sphere diameter
   - b) Graphical representation of particle size distributions
   - c) Calculation of average particle diameters
   - d) Analytical distribution functions

2. Separation and classification of particles
   - a) Global efficiency
   - b) Sieving

(Approved)
c) Sedimentation
d) Centrifugation (centrifuges + cyclones)
e) Collision and adhesion
f) Electrophoretic separation

3. Mixing and fluidisation
a) mixing of solids
b) mixing of solid/gas mixtures (fluidisation)
c) Mixing of liquids

4. Particle technology
a) Size reduction
b) Segregation of dry particulates
c) Storage and transport of granular material

5. Vapour-liquid separation processes: distillation
   flash, batch and continuous

6. Liquid/solid separation processes (leaching)

7. Crystallisation

Initial competences
   Profound knowledge of unit operations and process technology.

Final competences
   1) Thorough knowledge of unit operations that are used in bio-industrial production
   2) special attention to quantitative aspects

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
   Guided self-study, lecture, lecture: plenary exercises, seminar: coached exercises, seminar: practical PC room classes

Extra information on the teaching methods
   Theory: oral lectures (slides via Minerva)
   Exercises: calculations, partly PC-based (Excel+Matlab)

Learning materials and price
   Course notes are available Cost: 10 EUR

References

Course content-related study coaching
   Lecturer and assistants can be asked for additional coaching and help with numeric problems.

Evaluation methods
   end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period
   Written examination, open book examination

Examination methods in case of periodic evaluation during the second examination period
   Written examination, open book examination

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation
   not applicable

Extra information on the examination methods
   Theory: period aligned evaluation
   Exercises: period aligned evaluation
   Theory: written (open book)
   Exercises: written (open book)

(Approved)
Calculation of the examination mark