

## Physical Chemistry (E721040)

Course size (nominal values; actual values may depend on programme)

Credits 5.0 Study time 150 h Contact hrs 54.0 h

Course offerings and teaching methods in academic year 2018-2019

|                |       |                               |        |
|----------------|-------|-------------------------------|--------|
| A (semester 1) | Dutch | lecture                       | 30.0 h |
|                |       | seminar: coached<br>exercises | 24.0 h |
| B (semester 1) |       | lecture                       | 36.0 h |

Lecturers in academic year 2018-2019

Sabbe, Maarten TW11 lecturer-in-charge

Offered in the following programmes in 2018-2019

|  | crdts | offering |
|--|-------|----------|
| <a href="#">Bachelor of Science in Engineering Technology (main subject Chemical Engineering Technology)</a> | 5     | A        |
| <a href="#">Bachelor of Science in Chemical Engineering Technology</a>                                       | 5     | A        |
| <a href="#">Linking Course Master of Science in Chemical Engineering Technology</a>                          | 3     | B        |
| <a href="#">Preparatory Course Master of Science in Chemical Engineering Technology</a>                      | 5     | A        |

Teaching languages

Dutch

Keywords

Physical chemistry

Position of the course

Study of fundamental physical principles and models in order to explain chemical phenomena. In depth study of chemical thermodynamics.

Contents

Properties of gases.  
 Three laws of thermodynamics.  
 Fluent mastering of enthalpy, entropy and gibbs free energy in a chemical context.  
 Phase equilibria: pure substances, binary mixtures.  
 Working with phase diagrams.  
 The physical liquid surface.  
 Rheology and transport properties.  
 (Electro)chemical equilibrium and activity models.  
 Processes at solid surfaces: adsorption and heterogeneous catalysis .

Initial competences

The course Physical chemistry starts from certain final competences from the courses 'general chemistry', 'organic chemistry 1', 'organic chemistry 2' and 'inorganic chemistry'.

Final competences

- 1 Show insight in the fundamental physical principles and models that explain chemical phenomena.
- 2 Show insight in chemical thermodynamics.
- 3 To be able to implement elementary chemical reaction mechanisms and to predict the behavior of a chemical process based on theoretical insights.
- 4 To be able to think and to reason permanently in a critical, creative and scientific

way.

- 5 To be able to implement physicochemical insights on scientific and/or engineering problems, independently and teamwise.

#### 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

Lecture, seminar: coached exercises

#### Extra information on the teaching methods

Lecture (for course offerings A and B)

Seminar: coached exercises (for course offering A)

#### Learning materials and price

Syllabus (ca. 10 euro)

In case of guest lectures: powerpoint presentations

#### References

Atkins P. en de Paula J. (2002). Atkins' Physical Chemistry Seventh Edition. Oxford University Press. ISBN 0-19-879285-9.

Monk P. (2004). Physical Chemistry: Understanding our Chemical World. John Wiley & Sons. ISBN 0-471-49180-2.

#### Course content-related study coaching

Additional support and explanation is provided by appointment.

#### Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination with open questions, oral examination

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

Written examination with open questions, oral examination

#### Examination methods in case of permanent evaluation

Open book examination

#### Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible

#### Extra information on the examination methods

End-of-term evaluation and continuous assessment (for course offering A)

End-of-term evaluation (for course offering B)

#### Calculation of the examination mark

##### **Course offering A:**

Periodic evaluation: 60% (lecture)

Permanent evaluation: 40% (coached exercises)

For the permanent evaluation, two tests evaluate the skills acquired during the coached exercises. These tests are taken with open theory book, but the use of solved exercises is not allowed. An unauthorized absence on the test results in 0/20.

##### **Course offering B:**

Periodic evaluation: 100% (lecture)