

Applied Mathematics for Chemists (C001266)

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

Credits	5.0	Study time	150 h	Contact hrs	50.0 h
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Course offerings and teaching methods in academic year 2018-2019

A (semester 1)	Dutch	seminar: coached	25.0 h
		exercises	25.0 h
		lecture	

Lecturers in academic year 2018-2019

Van Daele, Marnix	WE02	lecturer-in-charge
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Offered in the following programmes in 2018-2019

Bachelor of Science in Chemistry	crdts	offering
	5	A

Teaching languages

Dutch

Keywords

Fourier-analysis, eigenvalues and eigenvectors, quantum mechanics

Position of the course

To show how problems in the field of chemistry are translated and solved in a mathematical way. Basic scientific skills (analytical thinking, critical reflection, problem solving, etc) are further developed during this course.

Contents

- Line integrals
- Vector analysis
- Fourier-analysis
- Eigenvalues and eigenvectors of matrices
- Applications of mathematics in classical and quantum mechanics

Initial competences

The student has earned a credit for "Mathematics I : fundamental methods" or the student has managed to obtain the necessary competences via equivalent courses (for which credits have been obtained).

Final competences

- 1 When confronted with a mathematical problem in the field of chemistry, the students select the suited mathematical techniques.
- 2 The students apply fluently the suited mathematical techniques.

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

Coaching via Ufora.

Learning materials and price

Lecture notes (in Dutch), exercises and solutions in printed and/or electronic form. The printed version costs about € 10. Also Maple-worksheets and Java-applets are used. All the material is available via the electronic learning environment Ufora.

References

E. Mendelson, F. Ayres, Schaum's Outline of Calculus, Mc Graw-Hill Trade, 1999.
I.E. Levine, Quantum Chemistry, Prentice Hall, 1991.

Course content-related study coaching

Exercise classes

Individual coaching by lecturer/assistant : consultation by appointment

Coaching via Ufora.

Evaluation methods

end-of-term evaluation

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

Written examination with open questions, open book examination

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

Written examination with open questions, 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

Written (open book form for exercises and closed-book form for theory) Evaluation of the knowledge and insight in basic concepts and the ability to apply these concepts in problem cases.

Calculation of the examination mark

The final score is a weighted mean of the scores obtained in the theoretical exam and the exercise exam.