

Course Specifications

From the academic year 2015-2016 up to and including the

Quantum Mechanics II (E023060)

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

Credits 6.0 Study time 180 h Contact hrs 60.0 h

Course offerings and teaching methods in academic year 2016-2017

A (semester 1)	Dutch	seminar: coached	30.0 h
		lecture	30.0 h

Lecturers in academic year 2016-2017

Van Speybroeck, Veronique	TW17	lecturer-in-charge
Van Neck, Dimitri	WE05	co-lecturer

Offered in the following programmes in 2016-2017

	crdts	offering
Bachelor of Science in Engineering Physics	6	A
Bridging Programme Master of Science in Engineering Physics	6	A
Master of Science in Materials Engineering	6	A

Teaching languages

Dutch

Keywords

Quantum mechanics, angular momentum, perturbation theory

Position of the course

Basic concepts and advanced quantummechanics. A basic knowledge of the quantummechanics is required (as the concept of one-dimensional Schrödinger equation). It is the final intention to treat the (one-body) perturbation theory in great detail. The lectures are expected to give a founded basis for more specialised issues such as semi-conducting physics, atomic and molecular physics, subatomic physics, many-body problems, molecular modeling, etc.

Contents

- Three-dimensional problems - momentum: Generalities, Intrinsic momentum, Generalised momentum, 3D Schrodinger equation with spherical symmetry
- Perturbation calculus: Stationary perturbation calculus on a discrete, bound spectrum, Stationary perturbation calculus on a continuous spectrum, Time-dependent perturbation calculus

Initial competences

Quantummechanics I

Final competences

- 1 Possess detailed knowledge of concepts related to angular momentum and spin and have the ability to explain them.
- 2 Understand solution methods for Schrodinger equation in a spherical potential and being able to communicate about them.
- 3 Have detailed knowledge of Perturbation theory (stationary and time-dependent) and scattering theory and being able to apply it to relevant problems.
- 4 Have the skills for analyzing and applying two-level systems.

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

Classroom lectures; Classroom problem solving sessions

Learning materials and price

course notes 15 EUR

References

- Quantum Mechanics - B.H.Bransden and C.J.Joachain

Course content-related study coaching

Evaluation methods

end-of-term evaluation

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

Written examination, oral examination

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

Written examination, oral examination

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

not applicable

Extra information on the examination methods

During examination period:

Theory and Exercise exam

Theory : Oral exam with a written preparation for the theory, closed book

Exercises : Written exam, open book

Calculation of the examination mark