

## Quantum Computing (C003668)

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

**Credits 6.0**

**Study time 180 h**

**Course offerings and teaching methods in academic year 2024-2025**

A (semester 2)

English

Gent

lecture

seminar

**Lecturers in academic year 2024-2025**

Verstraete, Frank

WE05

lecturer-in-charge

**Offered in the following programmes in 2024-2025**

[Master of Science in Teaching in Science and Technology\(main subject Mathematics\)](#)

**crdts**

**offering**

6

A

[Master of Science in Teaching in Science and Technology\(main subject Physics and Astronomy\)](#)

6

A

[Master of Science in Mathematics](#)

6

A

[Master of Science in Physics and Astronomy](#)

6

A

[Master of Science in Physics and Astronomy](#)

6

A

[Exchange Programme in Mathematics \(master's level\)](#)

6

A

[Exchange Programme in Physics and Astronomy \(Master's Level\)](#)

6

A

### Teaching languages

English

### Keywords

Quantum computing, quantum entanglement

### Position of the course

This course aims to explain basic concepts of quantum computing and quantum entanglement .

### Contents

- Quantum entanglement
- Quantum computing
- Quantum Tensor Networks

### Initial competences

Knowledge of Linear algebra and Quantum mechanics

### Final competences

Basic knowledge about quantum computing and quantum entanglement.

### 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

Seminar, Lecture

### Study material

Type: Syllabus

Name: Syllabus'

Indicative price: Free or paid by faculty

Optional: no

## References

A. Kitaev, Classical and Quantum Computation, AMS

M. Nielsen & I. Chuang, Quantum Computation and Quantum Information, Cambridge University Press

## Course content-related study coaching

Outside lecture hours the teachers are available for further explanation.

## Assessment moments

end-of-term assessment

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

Oral assessment

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

Oral assessment

## Examination methods in case of permanent assessment

## Possibilities of retake in case of permanent assessment

not applicable

## Extra information on the examination methods

The written exams are exercises (open book), the oral exam is theory.

## Calculation of the examination mark

- Written exam: 40%
- Oral exam: 60%