

## Molecular Toolbox (C003817)

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

**Credits 4.0**

**Study time 110 h**

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

A (semester 1)

English

Gent

seminar

lecture

practical

**Lecturers in academic year 2024-2025**

Gheysen, Godelieve

LA25

lecturer-in-charge

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

[International Master of Science in Agro- and Environmental Nematology](#)

**crdts**

4

**offering**

A

**Teaching languages**

English

**Keywords**

DNA structure, gene expression, gel electrophoresis, PCR, cloning, restriction enzyme, hybridisation, DNA sequence, DNA polymorphisms, genetic engineering.

**Position of the course**

Basic course in molecular biology as preparation to

- Nematode systematics and molecular phylogenetics
- Molecular aspects of plant-nematode interactions

The aim of this course is to give the student knowledge of and insight in gene structure, gene expression and the most widely used molecular techniques

**Contents**

- 1 DNA and gene structure, gene expression
- 2 Basic molecular biology techniques: restriction enzymes, RFLP, cloning, hybridisation, RNA and protein analysis
- 3 DNA-sequence analysis and PCR
- 4 Different methods for the detection of DNA polymorphisms
- 5 Genetic engineering
- 6 RNAi
- 7 High throughput methods (micro-array, next-generation sequencing)

**Initial competences**

Basic knowledge biology and biochemistry.

**Final competences**

- 1 Have insight into the structure of DNA, RNA, and proteins and the central dogma of molecular biology.
- 2 Explain the technical steps executed in the basic techniques used for molecular analysis.
- 3 Describe the purpose and the (dis)advantages of the basic techniques used for molecular biology.
- 4 Choose and justify an appropriate molecular technique for a certain purpose (routine analysis, diagnostics, experiment, ...).

**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, Practical

## Extra information on the teaching methods

Practical exercises:

2 lab sessions: DNA-extraction, PCR, restriction, agarose gel electrophoresis, poly-acrylamide gel electrophoresis for protein analysis; evaluated by participation

2 computer sessions; evaluated by small report

## Study material

Type: Syllabus

Name: Molecular toolbox

Indicative price: € 17

Optional: no

Language : English

Number of Pages : 120

Oldest Usable Edition : 2024

Available on Ufora : Yes

Type: Slides

Name: ppt

Indicative price: Free or paid by faculty

Optional: no

Language : English

Number of Slides : 350

Available on Ufora : Yes

## References

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## Course content-related study coaching

by email or personally (after the class or on appointment)

## 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

Participation, Assignment

## Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

## Extra information on the examination methods

Oral examination with written preparation

## Calculation of the examination mark

- 80% on examination
- 20% on participation and report of practical exercises.

Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.