GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Plants, Pathogens and Pests (I002626)

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

Credits 5.0 **Study time 150 h**

Course offerings in academic year 2025-2026

A (semester 2)	English	Gent

Lecturers in academic year 2025-2026

Höfte, Monica	LA21	lecturer-in-charge
Kyndt, Tina	LA25	co-lecturer
Van Leeuwen, Thomas	LA21	co-lecturer

Offered in the following programmes in 2025-2026	crdts	offering
International Master of Science in Agro- and Environmental Nematology	5	A
Master of Science in Bioscience Engineering: Cell and Gene Biotechnology	5	A
Exchange Programme in Bioscience Engineering: Agricultural Sciences (master's level)	5	A
Exchange Programme in Bioscience Engineering: Cell and Gene Biotechnology (master's level)	5	A

Teaching languages

English

Keywords

Basal and induced defence mechanisms, Plant-pathogen interactions, Pathogen-associated molecular patterns, virulence and pathogenicity factors, effectors, bacterial pathogens, fungal pathogens, plant-parasitic nematodes, viral pathogens, mites and insects

Position of the course

Insights in the molecular changes that occur during plant-pathogen/pest interactions can lead to innovative approaches to control plant diseases and plant pests.

Contents

1. Basal and induced defense mechanisms: constitutive and inducible defense, DAMP, MAMP, HAMP, NAMP and PAMP triggered immunity, resistance genes, signal transduction, induced resistance, plant hormones.
2. Introduction to the most important groups of fungal and bacterial plant pathogens and the molecular mechanisms that they use to interact with their host
2.1. Bacterial plant pathogens: adhesion, penetration, colonization, type III secretion, bacterial effector proteins, toxins, cell wall degrading enzymes, hormones
2.2. Fungal plant pathogens: pathogenomics of Oomycetes, powdery mildews, Magnaporthe, Pleosporales, Botrytis and Sclerotinia, Fusarium, rusts and smuts
3. Introduction to the most important types of plant parasitic nematodes and the molecular mechanisms of their interaction with plants
3.1. important plant-parasitic nematodes and their feeding behavior
3.2. attraction, invasion & migration, cell wall degrading enzymes
3.3. formation of feeding cells, plant peptide mimics, effectors, role of hormones
3.4. molecular methods for nematode control
4. Introduction to the most important types of arthropod pests (mites, insects) and the molecular mechanisms of their interaction with plants
4.1 Important crop pests, their host range and feeding mode
4.2 strategies plants have evolved to cope with herbivores

4.3 traits herbivores have evolved that enable them to counter plant defences

Initial competences

Biochemistry, basics molecular biology, plant and animal biology, microbiology

Final competences

1 Have insight into the plant defence system.
2 Have knowledge on the most important types of plant pathogens and pests.
3 understand the molecular mechanisms that are important for the interaction between pathogens/pests and a host plant.
4 read scientific publications in the field of plant-pathogen/pest interactions
5 critically discuss recent scientific literature concerning plant-pathogen and plant-pest interactions

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, Practical, Peer teaching

Extra information on the teaching methods

Theory: oral lectures
Exercises: experiments in laboratory and greenhouse

Study material

Type: Slides

Name: Plants, Pests and Pathogens
Indicative price: Free or paid by faculty
Optional: no
Language : English
Oldest Usable Edition : 2024
Available on Ufora : Yes
Online Available : No
Available in the Library : No
Available through Student Association : No

References

Course content-related study coaching

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

Assessment moments

end-of-term and continuous assessment

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

Oral assessment, Assignment

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

Practical exercises: evaluation based on participation and report (20% of total score)
Theory: evaluated by oral examination with written preparation (80% of total score)

Calculation of the examination mark

Practical exercises: evaluation based on participation and report (20% of total score)
Theory: evaluated by oral examination with written preparation (80% of total score)
Students who eschew period aligned and/or non-period aligned evaluations for this

course unit may be failed by the examiner.