GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Plant Tissue Culture (I700035)

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

Credits 4.0 **Study time 120 h**

Course offerings and teaching methods in academic year 2024-2025

A (semester 1)	Dutch	Gent	practical
			lecture

Lecturers in academic year 2024-2025

Werbrouck, Stefaan	LA21	lecturer-in-charge

Offered in the following programmes in 2024-2025	**crdts**	**offering**
Bachelor of Science in Bioscience Engineering Technology	4	A
Linking Course Master of Science in Bioscience Engineering Technology: Agriculture and Horticulture (main subject Horticulture)	4	A
Preparatory Course Master of Science in Bioscience Engineering Technology: Agriculture and Horticulture (main subject Horticulture)	4	A

Teaching languages

Dutch

Keywords

Biotechnology, biochemisty, in vitro culture, meristem

Position of the course

Plant tissue Culture is the aseptic and controlled culture of plant parts such as isolated organs, tissues, embryos, ovaria,... on an artificial medium in a closed recipient. During the classical plant breeding process or during the vegetative propagation of a large number of crops, there is an “in vitro” phase. Also for genetic modification of a crop, knowledge about tissue culture is essential. Do we want the in vitro plant or plant tissue to produce roots, callus or new shoots? Should the plant stay short or should it grow elongated? How can we influence its senescence? This course wants to provide insight in how we control a plant or its tissue in vitro, what’s the meaning for practice and what are the problems? A number of basic skills are gained in a well-equipped laboratory. Making complex media, initiation in vitro, in vitro multiplication, acclimatization.

Contents

Theory: historic overview; botanical base, media, recipients, machines and their use, applications (meristem culture, callus culture, cell suspensions, protoplast culture, induction of new meristems, somatic embryogenesis, synthetic seeds, induction of haploids), problems (contamination, hyperhydricity, browning, genetic variation), lab design, commercialization.

Exercices : basic techniques for medium preparation, sterile manipulation, initiation by seed and axillary meristems, controlling with plant hormones. Then it’s time for own in vitro projects.

Initial competences

Plant Tissue Culture builds on certain competences of Anatomy and morphology of higher plants, plant physiology, genetics, biochemistry, General and anorganic chemistry I, II. Or these competences were acquired in another way.

Final competences

1 **KNOWLEDGE & INSIGHT:** To define plant tissue culture terminology
2 **KNOWLEDGE & INSIGHT:** To discuss and explaining in vitro techniques for initiation, propagation, rooting, acclimatisation and breeding
3 **KNOWLEDGE & INSIGHT:** To calculate an in vitro medium
4 **SKILLS:** To apply techniques to control growth or induction of axillary and adventitious meristems
5 **SKILLS:** To analyse in vitro problems and bottlenecks and to propose solutions
6 **SKILLS:** To substantiate and to critically approach technical possibilities
7 **ATTITUDES:** To work with precision and sense for detail

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

Extra information on the teaching methods

During the practicum, practical skills are taught but there is also opportunity for own experiments.

Study material

Type: Syllabus

Name: Plant tissue culture
Indicative price: € 20
Optional: no
Language : Dutch
Number of Pages : 117
Oldest Usable Edition : plant tissue culture 2020
Available on Ufora : Yes
Online Available : Yes
Available in the Library : No
Available through Student Association : No
Additional information: Self printing

References

Course content-related study coaching

Possibility for questioning during lessons and after appointment, guidance and coaching during excercises.

Assessment moments

end-of-term and continuous 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

Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

Theory: oral examination with written preparation: 4 questions have to be drawn
Exercices: report by means of a powerpoint presentation of project

Calculation of the examination mark

Theory: 80%
Execices : 20%