Hanze

Course: Plant Physiology & Biotechnology — credits: 10

Course code	BOVH24RPLANTBIO
Name	Plant Physiology & Biotechnology
Study year	2025-2026
ECTS credits	10
Language	Dutch, with parts in English
Coordinator	D. den Os

Modes of delivery	Guest lecture International excursion Lecture Practical / Training Project-based learning Tutorial
Assessments	Plantenfysiologie Theorie - Computer, organised by STAD examinations Practicum & Project Planten - Other assessment

Learning outcomes

This module has the following learning outcomes:

• You explain plant physiological responses to light, nutrients, and other environmental factors, as well as the role of plant constituents according to current scientific insights;

• You understand the functioning of spectroscopy, thin-layer chromatography (TLC), and high-performance liquid chromatography (HPLC) and apply this knowledge to analyze plant constituents in a biological laboratory;

• You analytically and statistically quantify various plant physiological parameters using provided protocols in a biomedical laboratory and report your findings in a digital labjournal or measurement sheet according to the program guidelines;

• You investigate, within a project group with limited guidelines and supervision, the effects of different conditions on the growth, development, and/or constituents of plants in a biological laboratory, and report the outcomes in a report following scientific standards;

• You reflect on the contribution of plant physiological research from a company/organization to the Sustainable Development Goals (SDGs) and you orally reflect on your own development and progress within the Biology and Medical Laboratory Research program, following the program guidelines.

Content

Due to climate change and the loss of biodiversity, global food production is under increasing pressure. Issues such as "How can we make agriculture future-proof?" are more important than ever. Plants form the basis for food production. To grow crops sustainably, productively, and with high nutritional value, knowledge of plant physiology is crucial. This course covers how plants are structured, how they respond to light, nutrients, and other environmental factors, and how these responses are related to the plant's chemical composition.

The module consists of several components. Various plant physiological concepts and analytical methods are covered in lectures. This knowledge is applied during several practical experiments with plants. In these experiments analytical techniques such as TLC, HPLC, and spectrometry are applied. Focus is also given to growing plants under sterile conditions and isolating plant constituents using setups like a Soxhlet apparatus. Statistical analyses are performed on the obtained data to examine its value.

In addition to experiments with pre-designed protocols, students work in project groups on setting up their own experiment. Within the given framework of the project, the project group conducts research on growth, development, and/or constituents of plants under defined conditions. Based on this project, each student authors a scientific report individually.

To gain more insight into how companies working with plants operate, a group excursion is organized to a plant-related company. Here, the connection is made with the Sustainable Development Goals and how the company contributes to these goals. Reflection on this is done through a report.

The module concludes with self-reflection on the professional development of the student so far and their own ideas about future professional development are presented.

Included in programme(s)

Major Biology and Medical Research

School(s)

Institute for Life Science & Technology

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