

“Plant phenomics”		
Institute of Plant Genetics Polish Academy of Sciences	Coordinator: dr hab. Lidia Błaszczyk, prof. IPG PAS	Lecturer: prof. dr hab. Anetta Kuczyńska, IPG PAS (A) dr hab. Krzysztof Mikołajczak, prof. IGR PAN, IPG PAS (B) dr hab. Piotr Ogrodowicz, IPG PAS (C)

General information:

Number / form (s) / type (s) of classes	A series of lectures, 14 didactic hours (supervised by lecturers)
Didactic cycle	winter semester 2025/2026
Language	English
ECTS credits	2

Objective of the course:

To provide a comprehensive introduction to the principles, methods, and applications of plant phenomics, with a focus on its integration with other “-omics” in barley research

Topics:

1. Plant phenomics – definition, relevance, and its place among the “-omics” (**A**) (2 hr) [04/11/2025]
2. Platforms and technologies for plant phenotyping (**B**) (2 hr) [25/11/2025]
3. Case studies on vegetation indices and plant architecture analysis (**C**) (2 hr) [02/12/2025]
4. Phenomics in abiotic and biotic stress research (**A**) (2 hr) [16/12/2025]
5. Integrating phenomics with other ‘omics’ in studies of barley leaves (**B**) (2 hr) [13/01/2026]
6. Integrating phenomics with other ‘omics’ in studies of barley roots (**C**) (2 hr) [20/01/2026]
7. Integrating phenomics with other ‘omics’ in studies of barley crown (**A**) (2 hr) [27/01/2026]

Effects of the course (in terms of knowledge, skills):

1. Understand the definition and scope of plant phenomics and its relationship to other “-omics.”
2. Gain knowledge of major platforms and technologies for plant phenotyping in controlled and field conditions.
3. Apply concepts of vegetation indices and plant architecture analysis to real case studies.
4. Recognize the role of phenomics in studying plant responses to abiotic and biotic stresses.
5. Develop skills in integrating phenotypic data with genomic, transcriptomic, proteomic, and metabolomic information.
6. Acquire practical experience in analyzing phenomics data from different plant organs (leaves, roots, crown).
7. Enhance the ability to critically evaluate research approaches and applications of phenomics in plant science.

Course content:

- Introduction to plant phenomics and its role among other “-omics”
- Platforms and technologies for plant phenotyping
- Case studies: vegetation indices and plant architecture
- Phenomics in abiotic and biotic stress research
- Integrating phenomics with other “-omics” in barley: leaves, roots, and crown

Teaching methods / techniques:

lectures in English, on site lectures [no zoom lectures unless pandemic situation occurs]

Evaluation of learning outcomes:

- written exam