

**SYLLABUS**  
**Summer semester 2025/2026**  
**Lecturer: dr hab. Tomasz Leski**

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| <b>Title of the course</b>                          | <b>Ecology of woody plants</b>  |
| <b>Institution where the course will take place</b> | Institute of Dendrology, Polish Academy of Sciences   |
| <b>Language</b>                                     | English   |
| <b>Learning objectives</b>                          | Introducing students to a broad spectrum of knowledge on the ecology of woody plants, starting with biology of tree seeds and buds, through the plant response to abiotic stresses, tree invasions, phytoremediation process, plant-insect interactions, fine root growth, development and function to mycorrhizal symbiosis and factors shaping community diversity of mycorrhizal fungi. Learning objectives were planned to meet the learning outcomes defined at level 8 (P8) of the Polish Qualifications Framework. |
| <b>Type of the course</b>                           | Obligatory lecture  |
| <b>Semester/Year</b>                                | Summer semester 2025/2026   |
| <b>Name of the lecturer</b>                         | dr hab. Marcin Dyderski, prof. dr hab. Grzegorz Iszkuło, prof. dr hab. Marian Giertych, dr Paweł Horodecki, dr Mikołaj Wawrzyniak, dr hab. Joanna Mucha, dr hab. Ewa Kalemba, dr Hanna Fuchs, dr hab. Marzenna Guzicka, dr hab. Agnieszka Szuba, dr hab. Tomasz Leski, dr hab. Leszek Karliński, dr hab. Marcin Pietras   |
| <b>Name of the examiner</b>                         | dr hab. Tomasz Leski, prof. ID PAN  |
| <b>Teaching methods</b>                             | Lecture with multimedia presentation, case study method, and didactic discussion. Student: own work with the literature.  |
| <b>Attendance requirements</b>                      | General knowledge of the basics of the biology, plant physiology and biochemistry, plant genetics, molecular biology, and ecology is required. Attendance (without a delay) is obligatory, except for documented earlier planned participation in conferences, training courses, and scientific workshops related to the implementation of the doctoral thesis, sick leave, a significant life-event, or an emergency. Attendance is marked as  |

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|  | follows: 'Present', 'Late' or 'Absent'. Repeated absence or delay may cause dismissal.   |
| <b>Number of ECTS points</b>                                       | 4 ECTS   |
| <b>Number of lectures</b>  | 13   |
| <b>Didactic methods</b>  | Lecture with multimedia presentation. Case study method. Didactic discussion, student: own work with the literature  |
| <b>Methods of verification and assessment of learning outcomes</b> | Exam: written test   |
| <b>Conditions of a positive evaluation</b>                         | Attendance and positive grade on the written test  |
| <b>Course content</b>  | Trees bud dormancy - benefits and threats under climate changes;<br>Mechanism of seed survival in the natural environment and under stress conditions;<br>Seed dormancy, germination and seedling establishment;<br>The sex life of woody plants;<br>Polluted environments and their phytoremediation by woody plants;<br>Forest litter - it matters;<br>Determinants and consequences of trees and shrub invasions;<br>Plant-insect interactions;<br>Mutualism and antagonism: Ecological interactions among vertebrates and woody plants;<br>Functional characteristics of fine roots;<br>Plant-fungi interactions;<br>Mycorrhizal symbiosis - diversity and functions |
| <b>Literature of the course materials</b>                          | Berg B., McClaugherty C. 2014. Plant Litter. Decomposition, Humus Formation, Carbon Sequestration, 3rd ed. Springer-Verlag GmbH, Berlin-Hidelberg.<br>Herrera C.M., Pellmyr O. 2009. Plant animal interactions: an evolutionary approach. John Wiley & Sons.<br>Jolivet J. 1998. Interrelationship between insects and plants CRC Press; Boca Raton, Boston, London, New York, Washington.<br>Peterson R.L., Massicotte H.B., Melville L.H. 2004. Mycorrhizas: anatomy and cell biology. NRC Research Press.<br>Ansari A.A., Gill S.S., Gill R., Lanza G.R., Newman L. 2016. Phytoremediation management of environmental contaminants. Springer.                        |

- Rejmánek M. 2014. Invasive trees and shrubs: where do they come from and what we should expect in the future? *Biological Invasions* 16:483–498.
- Richardson D.M., Pyšek P., Carlton J.T. 2011. A compendium of essential concepts and terminology in invasion ecology. In: Richardson D.M. (ed) *Fifty years of invasion ecology: the legacy of Charles Elton*. Blackwell Publishing Ltd, Oxford, pp 409–420.
- Schoonhoven L.M.; van Loon J.J.A.; Dicke M. 2005. *Insect-plant biology* Oxford University Press; Oxford., New York.
- Tedersoo L. et al. 2014. Global diversity and geography of soil fungi. *Science* 1256688.
- Vogt K.A., Grier C.C., Vogt D.J., 1986. Production, Turnover, and Nutrient Dynamics of Above- and Belowground Detritus of World Forests. In: MacFadyen A., Ford E.D. (Eds.), *Advances in Ecological Research*. Academic Press, pp. 303–377.
- McCormack M. L. et al. 2015. Redefining fine roots improves understanding of below-ground contributions to terrestrial biosphere processes. *New Phytologist* 207(3):505-518.