

Module Descriptions

Module designation	Plant Nutrition (course code MPB 2234)
Semester(s) in which the module is taught	6 st semester of Bachelor Programme in Biology
Person responsible for the module	1. Riza Linda, M. Si
Lecture (s)	1. Dr. Zulfa Zakiah, M.Si
Language	Indonesia
Names of other study programmes with which the module is shared	-
Relation to curriculum	Elective course
Teaching methods	Collaborative learning
Workload (incl. contact hours, self-study)	Total workload: 4.38 ECTS Lecture: 26,6 hours (0,99 ECTS) Assignment: 46.5 hours (1.72 ECTS) Self-study: 44.9 hours (1.67 ECTS) Self-study hours are estimation numbers of hours; each student will approach studying in different ways.
Credit points	2 credits
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Intended Learning Outcomes (ILO) Knowledge (ILO-2) Able to integrate and apply biological science and other scientific fields that support the development of biological science General Skill (ILO-3) Able to collaborate effectively within a team and to communicate actively, both orally and in writing, in the domain of biology. Course learning outcomes (CO) CLO 11. The ability to analyze the interactions among living organisms, ranging from the population level to the biosphere for understanding ecological dynamics. CLO 17. The ability to collaborate within a team to successfully complete case studies or projects in the field of biology and to present the findings effectively.
Content	Introduction: definition of soil fertility and plant nutrients. Relationship between soil and plants. Plant nutrient transport. Soil acids and bases. Nitrogen in soil and plants. Phosphorus and Potassium in soil plants. Sulfur, calcium, magnesium in soil and plants. Micronutrients in soil and plants. Nutrient management
Examination forms	1. Midterm (written test) 30% 2. Final Exams (written test) 40% 3. Assignment (scientific paper, presentation, literature review) 20% 4. Activity (quiz or class discussion) 10%
Study and examination requirements	75% attendance

Reading list	1. Barker, A.J., & D.J. Pilbeam. 2015. Hand Book of Plant Nutrition. Second Edition. Taylor & Francis Group. CrC Press. Boca Raton, London. 2. Chandrasekaran, B., K. Anadurai, & E. Somasundaram. 2010. A Text Book of Agronomy. New Age International (P) Ltd., Publishers. New Delhi. 309 3. Motsara, M.R.,& R.N. Roy. 2008. Guide to Laboratory establishment for plant nutrient analysis. FAO Fertilizer and Plant Nutrition Bulletin. Food and Agriculture Organization of The United Nations. Rome. Italy. 4. Wiedenthoeft, C.A. 2006. Plant Nutrition. Chelsea House Publisher. New York 5. Kumar, N & Singh, H. 2024. Plant Functional Traits for Improving Productivity. Springers Publisher. Singapore 6. Konrad, M., Ernest, A.K. 2012. Principles of Plant Nutrition. Kluwer Academic Publisher.
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