Module Descriptions

Module designation	**Soil Microbiology** (course code MPB 3184)
Semester(s) in which the module is taught	3
Person responsible for the module	Prof.Dr.Dra.Siti Khotimah, M.Si
Lecture (s)	Prof.Dr.Dra.Siti Khotimah, M.Si Rahmawati, S.Si, M.Sc Rikhsan Kurniatuhadi, M.Si
Language	Indonesian language
Relation to curriculum	**Elective**
Teaching methods	Lecture, practical sessions
Workload (incl. contact hours, self-study hours)	Total workload: 7.06 ECTS ● Lecture: 26,6 hours (0,99 ECTS) ● Assignment: 60.1 hours (2.23 ECTS) ● Self-study: 56 hours (2.07 ECTS) ● Practical sessions: 47.8 hours (1.77 ECTS) Practical sessions will complement and reinforce the concepts that are taught in the lectures by providing hands-on experience to apply the theoretical knowledge gained).
Credit points	3 unit
Required and recommended prerequisites for joining the module	Microbial systematics (course code MPB 2107) Microbial physiology (course code MPB 2217)

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. Specific Skill (ILO-6) Able to apply biological methodology and use instruments by prioritising work safety and able to apply in the management of tropical wetland resources. **Course outcomes (CO)** CO 1 (CLO 11): The ability to analyze the interactions among living organisms, ranging from the population level to the biosphere for understanding ecological dynamics.. CO2 (CLO 14): The ability to apply the principles of microbiology, zoology, and botany to facilitate the utilization of biological resources and the development of biologically-based products.. CO3 (CLO 16): The ability to correlate biological sciences with global issues, including climate change, biodiversity conservation, and environmental sustainability. CO4 (CLO17) : 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 CO5 (CLO 27): The ability to operate biological instruments and methodologies by prioritising work safety in the observation and measurement of biological and environmental objects. .
Content	Soil Microbiology, basic factors or principles of Soil Microbiology, development of soil microorganisms,activities of rhizosphere and phyllosphere microorganisms for plant growth, nitrogen fixation and symbiotic associations of soil microorganisms, decomposition of organic matter by soil microorganisms, nitrification and denitrification, metabolite products of soil microorganisms for plant growth, nutrient uptake process by soil microorganisms, biodegradation of pesticides and pollutants by soil microorganisms, role of soil microorganisms in agricultural biotechnology, analysis of soil microbiology.
Examination forms	1. Theory 75% (case study method) a. Midterm 25% b. Final Exams 25% c. Assigment 40% d. Activity 10% 2. Lab works 25%
Study and examination requirements	Re-registration and 75% attendance.

Reading list	1) Hidayat, R., & Utomo, S. B. (2024). Mikroba Tanah: Peran, Interaksi, dan Pengelolaan. IPB Press. 2) Paul, E. A. (Ed.). (2007). Soil Microbiology, Ecology, and Biochemistry (3rd ed.). Academic Press. 3) Rao NSS., 1999, Soil Microbiology, Fourth edition of Soil microorganisms and Plant Growth, SciencePublishers, Inc,Plymouth, UK. 4) Saputra, D., & Putra, A. (2022). Mikrobiologi Tanah: Dasar, Metode, dan Aplikasi. Gadjah Mada University Press.