Module Descriptions

A **module** is a self-contained **learning unit** within a higher education program that includes thematically related courses and is assigned a **fixed number of credits**. It follows specific **learning objectives**, includes an **assessment component**, and contributes to achieving the qualifications of a degree program. In some countries, “modules” are also named “courses”.

Please provide a module description for each module. In addition to the compulsory and elective modules, this also includes credited internships and the final thesis.

Please summarize all module descriptions in one document (Module Handbook) and create a table of contents so that the modules can be found easily.

Module designation	*Water, Soil, and Plant Interaction*
Semester(s) in which the module is taught	*5*
Person responsible for the module	*Prof. Dr. Ir. Nasaruddin*
Language	*Bahasa Indonesia*
Relation to curriculum	*Compulsory / ~~elective~~ / specialisation*
Teaching methods	*Face-to-face lectures and independent learning*
Workload (incl. contact hours, self-study hours)	1. *Lectures: 2 × 50 × 16 = 1,600 minutes (26.67 hrs)* 2. *Structured assignments: (total 2 × 60 × 16) = 1,920 minutes (32 hrs)* - *Individual assignments: 2 × 120 × 3 = 720 minutes (12 hrs)* - *Group assignments: 2 × 120 × 3 = 720 minutes (12 hrs)* - *Quiz: 2 × 15 × 8 = 240 minutes (4 hrs)* - *Discussion: 2 × 30 × 4 = 240 minutes (6 hrs)* 3. *Independent study: (total 2 × 60 × 16) = 1,920 minutes (32 hrs)* - *Accessing SIKOLA, participating in online discussion forums, reading materials, etc.* 4. *Practicum: (total: 1 × 170 × 16) = 2,720 minutes (45.33 hrs)* - *Laboratory work: 1 × 170 × 16 = 2,720 minutes (45.33 hrs)*
Credit points	*3 credits equal to 4.86 ECTS*
Required and recommended prerequisites for joining the module	-

Module objectives/intended learning outcomes	*In terms of knowledge:* - *Students are able to explain the relationship between temperature and plant growth, water availability for plant needs, and soil responses to plant growth.* - *Students are able to analyze and develop water availability for plant needs, soil responses to plant growth, and explain water potential in plants.* - *Students are able to analyze plant growth models and perform plant growth simulations.*
Content	1. *Scope of Optimal Plant Growth* 2. *Basic Theory of Plant Growth Environments* 3. *Role of Water, Mechanisms of Water Uptake, and Soil as a Growth Medium* 4. *Fundamentals of Water-Plant Relationships* 5. *Fundamentals of Light-Plant Relationships* 6. *Fundamentals of Temperature and Plant Growth Relationships* 7. *Concept of Water Availability for Plant Needs* 8. *Soil Responses to Plant Growth* 9. *Effects of Water Stress on Plants* 10. *Relationship Between Soil Physical Properties and Plant Growth* 11. *Plant Growth Models and Simulations*
Examination forms	*Quiz, individual assignment, group assignment, discussion*
Study and examination requirements	*To successfully pass the module, students must attend at least 80% of the classes, complete all assignments and exams, and obtain a final grade of at least 45%* (minimum passing grade: D).
Reading list	1. *Hasan, M. (2023). An Introduction to Soil-Water-Plant Relationship (1st ed.). CRC Press.* 2. *Nasaruddin, N. T., & Ifayanti, R. (2019). Fisiologi Tumbuhan.* 3. *Nasaruddin, N. T. (2018). Karakter Pertumbuhan, Kebutuhan Air dan Nutrisi Kakao. Makassar: Cacao Research Group, Faculty of Agriculture, Universitas Hasanuddin.* 4. *Harjadi, S. H. (2019). Dasar-dasar Agronomi. Jakarta: Gramedia Pustaka Utama.*