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	*Plant Physiology*
Semester(s) in which the module is taught	*3*
Person responsible for the module	*Prof. Dr. 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 × 10 = 300 minutes (5 hrs)* - *Discussion: 2 × 30 × 3 = 180 minutes (3 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	*Plant Biochemistry*

Module objectives/intended learning outcomes	*In terms of knowledge:* - *Student is able to understand the definition and scope of plant physiology* - *Student is able to explain the relationship between water and plants* - *Student is able to explain the processes and mechanisms of major metabolic activities in plants (photosynthesis and respiration)* - *Student is able to explain the growth and development of major plant organs and the role of phytohormones* - *Student is able to explain growth dynamics and analyze plant growth*
Content	1. *Definition, scope, and role of plant physiology* 2. *Role of water in plants and mechanisms of water movement in plants* 3. *Transpiration* 4. *Photosynthesis* 5. *Respiration* 6. *Plant growth and development* 7. *Control of growth and developmen* 8. *Plant growth movements* 9. *Dynamics of plant growth* 10. *Plant growth analysis*
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. *Zakaria, B. (2010). Stimulasi CO_2 terhadap Fotosintesis dan Cekaman Tanaman. Edited by Nasaruddin. Makassar: Kretakupa Print.* 2. *Gardner, F. P., Pearce, R. B., & Mitchell, R. L. (1991). Fisiologi Tanaman Budidaya. Translated by Herawati S. & Subiyanto. Jakarta: Universitas Indonesia Press.* 3. *Nasaruddin, & Musa, Y. (2010). Dasar-dasar Fisiologi Tumbuhan. Makassar: Masagena Press.* 4. *Salisbury, F. B., & Ross, C. W. (1995). Plant Physiology. Belmont, California: Wadsworth Publishing Company. 540 p.* 5. *Smith, J. (2009). Growth Regulators. Extension Floriculture Program, USDA's Cooperative State Research, Education, and Extension Service (CSREES), and College of Natural Resources and the Environment, University of Massachusetts Amherst.* 6. *Taiz, L., & Zeiger, E. (2003). Plant Physiology. New York: The Benjamin/Cummings Publishing Company, Inc.* 7. *Nasaruddin, Tahir, N., & Ridwan, I. (2019). Fisiologi Tumbuhan (Fitokhrom dan Hormon Pertumbuhan). Makassar: Ficus Press.*