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 Genetics*
Semester(s) in which the module is taught	*2*
Person responsible for the module	*Prof. Dr. Muh. Farid BDR*
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 (4 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)* - *Field 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	*Basics Chemistry* *Botany*

Module objectives/intended learning outcomes	*In terms of knowledge:* - *Student is able to understand the definition and scope of plant genetics* - *Student is able to explain the genetic material responsible for heredity* - *Student is able to explain the mechanisms of hereditary transmission* - *Student is able to explain deviations in the inheritance of hereditary factors* - *Student is able to explain the mechanisms of mutation and gene interaction and their implications for plants*
Content	1. *Definition and scope of plant genetics* 2. *Hereditary materials: DNA, RNA, and chromosomes* 3. *Genes and characters* 4. *Inheritance mechanisms across generations* 5. *Mendel's First Law and Mendel's Second Law* 6. *Hardy–Weinberg Law* 7. *Sex determination* 8. *Multiple alleles and gene interactions* 9. *Gene mutation*
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. *Acquaah, G. (2009). Principles of Plant Genetics and Breeding. John Wiley & Sons.* 2. *Crowder, L. V., Kusdiarti, L., & Soetarso. (1990). Genetika Tumbuhan. Yogyakarta: Gadjah Mada University Press.* 3. *Ronald, P. (2011). Plant Genetics, Sustainable Agriculture and Global Food Security. Genetics, 188(1), 11–20.* 4. *White, J. W., Andre-Sanchez, P., Gore, M. A., Bronson, K. F., Coffelt, T. A., Conley, M. M., ... & Jenks, M. A. (2012). Field-Based Phenomics for Plant Genetics Research. Field Crops Research, 133, 101–112.* 5. *Gupta, P. K., & Tsuchiya, T. (Eds.). (1991). Chromosome Engineering in Plants: Genetics, Breeding, Evolution. Newnes.* 6. *Shu, Q. Y., Forster, B. P., & Nakagawa, H. (Eds.). (2012). Plant Mutation Breeding and Biotechnology. CABI.* 7. *Pathirana, R. (2011). Plant Mutation Breeding in Agriculture. Plant Science Reviews, 107–110.*