

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	<i>Plant Genetics</i>
Semester(s) in which the module is taught	2
Person responsible for the module	<i>Prof. Dr. Ir. Muh. Farid BDR, MP.</i>
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<i>Compulsory / elective / specialisation</i>
Teaching methods	<i>Face-to-face lectures and independent learning</i>
Workload (incl. contact hours, self-study hours)	1. Lectures: $2 \times 50 \times 16 = 1,600$ minutes (26.67 hrs) 2. Structured assignments: (total $2 \times 60 \times 16$) = 1,920 minutes (32 hrs) - Individual assignments: $2 \times 120 \times 3 = 720$ minutes (12 hrs) - Group assignments: $2 \times 120 \times 3 = 720$ minutes (12 hrs) - Quiz: $2 \times 15 \times 8 = 240$ minutes (4 hrs) - Discussion: $2 \times 30 \times 4 = 240$ minutes (4 hrs) 3. Independent study: (total $2 \times 60 \times 16$) = 1,920 minutes (32 hrs) - Accessing SIKOLA, participating in online discussion forums, reading materials, etc. 4. Practicum: (total: $1 \times 170 \times 16$) = 2,720 minutes (45.33 hrs) - Laboratory work: $1 \times 170 \times 8 = 1,360$ minutes (4 hrs)
Credit points	<i>3 credits equal to 4.86 ECTS</i>
Required and recommended prerequisites for joining the module	-

Module objectives/intended learning outcomes	<i>In terms of:</i> - Students are able to understand the definition and scope of plant genetics. - Students are able to explain the genetic material responsible for heredity. - Students are able to explain deviations in hereditary factor transmission. - Students are able to explain the mechanisms of hereditary transmission. - Students are able to explain the mechanisms of mutation and gene interaction, as well as their implications for plants.
Content	1. Definition and scope of plant genetics 2. Hereditary materials: DNA, RNA, and chromosomes 3. Genes and characters 4. Transmission of hereditary traits across generations 5. Mendel's First and Second Laws 6. Hardy–Weinberg Law 7. Sex determination 8. Multiple alleles and gene interactions 9. Gene mutations
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). <i>Principles of plant genetics and breeding</i>. John Wiley & Sons. 2. Crowder, L. V., Kusdiarti, L., & Soetarso. (1990). <i>Genetika tumbuhan</i>. Gadjah Mada University Press. 3. Ronald, P. (2011). Plant genetics, sustainable agriculture, and global food security. <i>Genetics</i>, 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. <i>Field Crops Research</i>, 133, 101–112. 5. Gupta, P. K., & Tsuchiya, T. (Eds.). (1991). <i>Chromosome engineering in plants: Genetics, breeding, evolution</i>. Newnes. 6. Shu, Q. Y., Forster, B. P., & Nakagawa, H. (Eds.). (2012). <i>Plant mutation breeding and biotechnology</i>. CABI. 7. Pathirana, R. (2011). Plant mutation breeding in agriculture. In <i>Plant Science Reviews</i> (pp. 107–110).