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	*Analysis of Crossing Design Techniques*
Semester(s) in which the module is taught	*5*
Person responsible for the module	*Prof. Dr. Ir. Muh. Farid BDR, M.P.*
Language	*Bahasa Indonesia*
Relation to curriculum	*Elective*
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:* - *Student is able to explain the definition, scope, concepts, and objectives of the fundamentals of quantitative breeding.* - *Student is able to analyze advanced statistical concepts in plant breeding.* - *Student is able to apply advanced experimental designs for plant breeding.* - *Student is able to apply plant crossing designs (mating design).* - *Student is able to analyze the concepts of stability and adaptability in plant breeding.*
Content	1. *Definition, scope, and objectives of quantitative breeding fundamentals* 2. *Basic statistical analysis* 3. *Variance, covariance, genetic correlation, and path analysis* 4. *Analysis of variance and genetic parameters for multi-environment trials* 5. *Selection index* 6. *Split-plot design techniques* 7. *Alpha lattice design techniques* 8. *Biparental mating design techniques* 9. *North Carolina mating design techniques* 10. *Diallel mating design techniques* 11. *Three-way cross and line × tester design techniques, stability, and adaptability*
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. *Singh, R. K., and Chaudhary, B. D. (2007). Biometrical Methods in Quantitative Genetic Analysis. New Delhi, India: Kalyani Publishers.* 2. *Falconer, D. S. (1960). Introduction to Quantitative Genetics. London: Oliver and Boyd.* 3. *Acquaah, G. (2007). Principles of Plant Genetics and Breeding. USA: Blackwell Publishing.*