

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>Vegetative Breeding of Plants</i>
Semester(s) in which the module is taught	5
Person responsible for the module	<i>Prof. Dr. Ir. Muh. Farid BDR</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)	<i>Lectures: $2 \times 50 \times 16 = 1,600$ minutes (26.67 hrs)</i> <i>Structured assignments: (total $2 \times 60 \times 16$) = 1,920 minutes (32 hrs)</i> <i>Individual assignments: $2 \times 120 \times 3 = 720$ minutes (12 hrs)</i> <i>Group assignments: $2 \times 120 \times 3 = 720$ minutes (12 hrs)</i> <i>Quiz: $2 \times 15 \times 8 = 240$ minutes (4 hrs)</i> <i>Discussion: $2 \times 30 \times 4 = 240$ minutes (6 hrs)</i> <i>Independent study: (total $2 \times 60 \times 16$) = 1,920 minutes (32 hrs)</i> <i>Accessing SIKOLA, participating in online discussion forums, reading materials, etc.</i> <i>Practicum: (total: $1 \times 170 \times 16$) = 2,720 minutes (45.33 hrs)</i> <i>Laboratory work: $1 \times 170 \times 16 = 2,720$ minutes (45.33 hrs)</i>
Credit points	<i>3 credits equal to 4.86 ECTS</i>
Required and recommended prerequisites for joining the module	<i>Plant Genetics</i> <i>Statistics</i> <i>Plant Breeding</i> <i>Experimental Design</i> <i>Advanced Plant Breeding</i>

Module objectives/intended learning outcomes	<i>In terms of knowledge:</i> - Student is able to explain the scope and basic principles of plant breeding for vegetatively propagated plants. - Student is able to describe and apply the concepts of plant breeding for vegetatively propagated plants through in vivo methods. - Student is able to describe and apply the concepts of plant breeding for vegetatively propagated plants through in vitro methods. - Student is able to describe and apply the concepts of stress breeding combined with vegetative propagation breeding approaches.
Content	1. Introduction and Scope of Breeding in Vegetatively Propagated Plants 2. Basic Concepts of Breeding in Vegetatively Propagated Plants 3. Clonal Selection 4. Genetics of Vegetatively Propagated Plants 5. Breeding Methods for Obligate Vegetatively Propagated Plants 6. Breeding Methods for Facultative Vegetatively Propagated Plants 7. Development of New Varieties in Sugarcane 8. Development of New Varieties in Cassava and Sweet Potato 9. In Vitro-Based Vegetative Breeding Methods 10. Stress Breeding in Vegetatively Propagated Plants
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. Bos, I., and P. Caligari. (2008). <i>Selection Methods in Plant Breeding</i>. Second Edition. Springer Science + Business Media B.V., New York, USA. 2. Chahal, G. S., and S. S. Gosal. (2002). <i>Principles and Procedures of Plant Breeding: Biotechnological and Conventional Approaches</i>. Alpha Science International Ltd., U.K. 3. Poehlman, J. M., and D. A. Sleper. (1995). <i>Breeding Field Crops</i>. Fourth Edition. Iowa State University Press, Ames, USA. 4. Lebot, V. (2009). <i>Tropical Root and Tuber Crops: Cassava, Sweet Potato, Yams and Aroids</i>. CAB International, U.K. and USA. 5. James, G. (2004). <i>Sugarcane</i>. Blackwell Science Ltd., Australia. 6. Nur Basuki. (1992). <i>Sweet Potato Breeding</i>. In <i>Proceedings of the 1st Plant Breeding Symposium</i> (A. Kasno, M. Dahlan, and Hasnam, Eds.). Indonesian Plant Breeders Association (PPTI), East Java Regional Chapter, Malang. 7. Poespodarsono, S. (1992). <i>Cassava Breeding</i>. In <i>Proceedings of the 1st Plant Breeding Symposium</i> (A. Kasno, M. Dahlan, and Hasnam, Eds.). Indonesian Plant Breeders Association (PPTI), East Java Regional Chapter, Malang.