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	*Postharvest Physiology*
Semester(s) in which the module is taught	*5*
Person responsible for the module	*Prof. Dr. Ir. Fachirah Ulfa*
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 × 2 = 480 minutes (8 hrs)* - *Group assignments: 2 × 120 × 4 = 960 minutes (16 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	*Botany* *Basics of Agronomy*

Module objectives/intended learning outcomes	*In terms of knowledge:* - *Student is able to understand and apply proper pre-harvest handling techniques for fruits to achieve good quality produce.* - *Student is able to understand and apply proper post-harvest handling techniques for fruits to achieve good quality produce.* - *Student is able to understand and apply proper pre-harvest handling techniques for vegetables to achieve good quality produce.* - *Student is able to understand and apply proper post-harvest handling techniques for vegetables to achieve good quality produce.*
Content	1. *General explanation of the learning contract and the nature of agricultural products* 2. *Structure of agricultural products* 3. *Pre-harvest and post-harvest factors* 4. *Fruit quality* 5. *Harvest criteria* 6. *Respiration and climacteric* 7. *Ethylene and fruit ripening* 8. *Temperature effects* 9. *Control of fruit ripening (chemical modification, atmosphere, and irradiation)* 10. *Physiological disorders, chilling injury, and pathogenic disorders* 11. *Quality standards for horticultural products*
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. *Bautista, O. K. (1990). Postharvest Technology for Southeast Asian Perishable Crops. Technology and Livelihood Resource Centre, Los Baños, The Philippines.* 2. *Deddy, M. (1991). Fisiologi Pasca Panen Sayuran dan Buah-Buahan. Departemen Pendidikan dan Kebudayaan, Direktorat Jenderal Pendidikan Tinggi, Antar Universitas Pangan dan Gizi, IPB Bogor.* 3. *Effendi, M. (2010). Karakteristik Produk Hasil Pertanian. Retrieved from http://masud.lecture.ub.ac.id/ (accessed December 21, 2012).* 4. *Hong, S.-I. (2006). Packaging Technology for Fresh Produce. One Day International Seminar: Post-Harvest Losses of Cole Crops (Brassica Vegetables) – Causes and Solutions, FTIP, Unpad, Bandung.* 5. *Kader, A. A. (1992). Postharvest Technology of Horticultural Crops. The Regents of the University of California, USA.* 6. *Kartasapoetra, A. G. (1994). Teknologi Pasca Panen. PT. Rineka Cipta, Jakarta.* 7. *Mutiarawati, T. (2007). Pasca Panen Hasil Pertanian. Departemen Pertanian, Jakarta.* 8. *Pantastico, E. R. B. (1975). Postharvest Physiology, Handling and Utilization of Tropical and Subtropical Fruits and Vegetables. The AVI Publishing Co., Inc., Westport, Connecticut.* 9. *Weichmann, J. (1987). Postharvest Physiology of Vegetables. Marcel Dekker, Inc., New York, USA.* 10. *Wills, R., McGlasson, B., Graham, D., & Joyce, D. (1998). Postharvest: An Introduction to the Physiology and Handling of Fruit, Vegetables and Ornamentals. Hyde Park Press, Adelaide, South Australia.* 11. *Winarno, F. G. (1981). Fisiologi Lepas Panen. Sastra Hudaya, Jakarta.*