MODULE HANDBOOK

	UNIVERSITAS PADJADJARAN **FACULTY OF MATHEMATICS AND NATURAL SCIENCES** **BACHELOR OF BIOLOGY PROGRAMME**	**COURSE CODE:** D10D-3003
Module designation	Plants Structure and Development 2	
Semester in which the module is taught	3	
Persons responsible for the module	1. Dr. Mohamad Nurzaman 2. Dr. Tia Setiawati 3. Dr. Asep Zainal Mutaqin 4. Ruly Budiono, M.S	
Medium of instruction	Indonesian	
Relation to curriculum	Compulsory course	
Teaching methods	Cooperative learning, Inquiry learning, Problem based learning	
Workload	Total workload : 5440 minutes = 90.67 hours Lecture and discussion : 2 x 50 minutes x 16 weeks = 1600 minutes = 13.33 hours Exercises : 2 x 60 minutes x 16 weeks = 1920 minutes = 32 hours Self-study : 2 x 60 minutes x 16 weeks = 1920 minutes = 32 hours	
Credit points	2.00 (3.62 ECTS)	
Required and recommended prerequisites for joining the module	-	
Module objectives/intended learning outcomes	Students able to: 1. Explain the concept of plant development and the factors that influence it. 2. Explain the structure and function of shoot and root apical meristems. 3. Explain the structural, functional, and location characteristics of parenchymal tissue, collenchyma, and sclerenchyma. 4. Explain the structure of the epidermis and its derivatives, stomata, trichomes, and cuticles. 5. Identify the differences between external and internal secretory glands. 6. Compare the structure of primary and secondary xylem and phloem. 7. Describe the process of annual ring formation in dicot stems. 8. Compare the structure of dicot and monocot roots. 9. Analyze the distribution patterns of vascular bundles in dicot and monocot stems.	
Contents	This course contains knowledge about the structure and tissue of meristems, epidermis, support, vessels (vascular), and secretion glands. Also studied are the structure and development of leaf organs, stems, roots, flowers, fruits, seeds, and embryo development and germination.	
Examination forms	Quiz, Midterm exam, Assignment, Final exam, Participation, and Project	
Study and examination requirements	The minimum attendance in lectures is 80%. Final grades are evaluated based on quiz (10%), midterm exam (15%), assignment (10%), and final exam (15%), Participation (20%), and Project (30%)	
Reading lists	1. Esau, K. 1977. Anatomy of Seed Plants, 2nd edition, John Willey & Sons Inc. NewYork 2. Fahn, A. 1990. Plant Anatomy, 4th edition, Bergamon Press New York. 3. Beck, C. B. (2010). An Introduction to Plant Structure and Development: Plant Anatomy for the Twenty-First Century (2nd ed.). 4. Crang, R. C., Vassilyev, A., & Lyons, E. (2022). Plant Anatomy: A Concept-Based Approach to the Structure of Seed Plants. Springer. 5. Dhondt, S., et al. (2021). Current trends in 3D imaging of plant tissues and organs. Plant Physiology, 187(2), 445–456	