

Undergraduate Programme in Biology

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MODULE HANDBOOK

Module Name	Plant Morphogenesis	
Module level, if applicable	Bachelor	
Code, if applicable	BIO425060	
Subtitle, if applicable	-	
Botany	Plant Morphogenesis	
Semester(s) in which the module is taught	6 th (sixth)	
Person responsible for the module	Dias Idha Pramesti, S.Si.,M.Si	
Lecturer(s)	Shilfiana Rahayu, S.Si., M.Sc Dias Idha Pramesti, S.Si.,M.Si	
Language	Indonesian	
Relation to curriculum	Elective course in the third year (6 th semester) Bachelor Degree	
Type of teaching, contact hours	100 minutes of lectures, 170 minutes labwork and 120 minutes structured activities per week	
Workload	Total workload is 136 hours per semester, which consists of 100 minutes lectures per week for 16 weeks, 120 minutes structured activities per week, 120 minutes individual study per week, 170 minutes laboratory work in total is 16 weeks per semester, including mid-exam and final exam	
Credit points	3 credits (4,5 ECTS)	
Requirements according to the examination regulations	Students must meet a minimum attendance of 75% of the total meetings to be able to take the final exam	
Recommended prerequisites	No prerequisites are stated on	
Module objectives/intended learning outcomes	After completing this course, the students: CO 1 elaborate basic concepts in the study of plant morphogenesis CO 2. correlate the mechanisms involved in morphogenesis with plant growth patterns CO 3 analyze the stages of development with plant morphogenesis	
Content	1. Cell Polarity 2. Cellular Basis of Plant Growth and Development 3. Concepts of Growth and Development 4. Morphogenesis of plant vascular tissues, vegetative and sexual organs 5. Seed germination and embryonic development 6. Morphogenesis and Abnormalities	
Study and examination requirements and forms of examination	The final mark will be weighted as follows:	
	NO	Assessment methods (components, activities)
	Weight (percentage)	
	1	Final Examination
	35%	
	2	Mid-Term Examination
	35%	

	3	Class Activities: Quiz, Homework, etc.		15%																																										
	4	Mini project		15%																																										
<p>The final assessment is expressed in the form of a letter value converted from a number value with the following categories:</p> <table border="1"> <thead> <tr> <th>NO</th> <th>Number Value</th> <th>Letter Value</th> <th>NO</th> <th>Number Value</th> <th>Letter Value</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>≥ 95</td> <td>A</td> <td>7</td> <td>65-69.99</td> <td>B/C</td> </tr> <tr> <td>2</td> <td>90-94.99</td> <td>A-</td> <td>8</td> <td>60-64.99</td> <td>C+</td> </tr> <tr> <td>3</td> <td>85-89.99</td> <td>A/B</td> <td>9</td> <td>55-59.99</td> <td>C</td> </tr> <tr> <td>4</td> <td>80-84.99</td> <td>B+</td> <td>10</td> <td>50-54.99</td> <td>C-</td> </tr> <tr> <td>5</td> <td>75-79.99</td> <td>B</td> <td>11</td> <td>55-34.99</td> <td>D</td> </tr> <tr> <td>6</td> <td>70-74.99</td> <td>B-</td> <td>12</td> <td><35</td> <td>E</td> </tr> </tbody> </table>					NO	Number Value	Letter Value	NO	Number Value	Letter Value	1	≥ 95	A	7	65-69.99	B/C	2	90-94.99	A-	8	60-64.99	C+	3	85-89.99	A/B	9	55-59.99	C	4	80-84.99	B+	10	50-54.99	C-	5	75-79.99	B	11	55-34.99	D	6	70-74.99	B-	12	<35	E
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Media employed	White-board, Lcd Projector, e-learning (https://daring.uin-suka.ac.id/)																																													
Reading list	<ol style="list-style-type: none"> Lersten, N.R. 2004. Flowering Plant Embryology. Blackwell Publishing. Evert, R.F. 2006. Esau's Plant Anatomy: Meristems, Cells, and Tissues of the Plant Body: Their Structure, Function, and Development, Third Edition. John Wiley&Sons, New York. Campbell Biology, 2019, Jane Reece, Lisa A. Urry, Peter V. Minorsky, Michael L. Cain, Steven A. Wasserman, Pearson. Suradinata, T.S. 1998. Struktur Tumbuhan. Penerbit Angkasa Bandung. Maheswari, P. 1950. An introduction to The Embryology of Angiosperms. First Edition. McGraw-Hill Book Company, Inc. New York-Toronto-London Nugroho, L.H., Purnomo, I. Sumardi. 2010. Struktur dan Perkembangan Tumbuhan. Penebar Swadaya. Jakarta. Sinnot, E.W, 1960, Plant Morphogenesis, McGraw-Hill Book Company, New York, Toronto, London B.M Johri.1984. Embryology of Angiosperm. Springer Verlag. Berlin Esau, K. 1977. Anatomy of Seed Plants, 2nd edition, John Willey & Sons Inc. New York Harnvanichvech Y, Gorelova V, Sprakel J, Weijers D (2021). The Arabidopsis embryo as a quantifiable model for studying pattern formation. <i>Quant Plant Biol</i> 2(e3):1–13 Bhatla, S.C., Lal, M.A. (2023). Embryogenesis, Growth, and Differentiation. In: Plant Physiology, Development and Metabolism. Springer, Singapore. Alma Armenta-Medin, C. Stewart Gillmor, Peng Gao, Javier Mora-Macias, Leon V. Kochian, Daoquan Xiang, Raju Datla. 2021. Developmental and genomic architecture of plant embryogenesis: from model plant to crops. <i>Plant Communications</i> 2, 100136. Tilly Eldridge, Łukasz Łangowski, Nicola Stacey, Friederike Jantzen, Laila Moubayidin, Adrien Sicard, Paul Southam, Richard Kennaway, Michael Lenhard, Enrico S. Coen, Lars Ostergaard. 2016. Fruit shape diversity in the Brassicaceae is generated by varying patterns of anisotropy. <i>Development</i> (2016) 143 (18): 3394–3406. Zuch, D. T., Doyle, S. M., Majda, M., Smith, R. S., Robert, S. and Torii, K. U. (2022). Cell biology of the leaf epidermis: fate specification, morphogenesis, and coordination. <i>Plant Cell</i> 34, 209-227. https://doi.org/10.1093/plcell/koab250 Mansfield, C., Newman, J. L., Olsson, T. S. G., Hartley, M., Chan, J. and Coen, E. (2018). Ectopic BASL reveals tissue cell polarity throughout leaf development in 																																													

	<p>Arabidopsis thaliana. <i>Curr. Biol.</i> 28, 2638-2646. https://doi.org/10.1016/j.cub.2018.06.019</p> <p>16. Kim MH, Bae EK, Lee H, Ko JH (2022) Current understanding of the genetics and molecular mechanisms regulating wood formation in plants. <i>Gene</i> 13:1181</p>
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PLO and CO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11
CO 1				√							
CO 2				√							
CO 3					√						