

Universitas Negeri Surabaya Faculty of Mathematics and Natural Sciences Biology Undergraduate Study Program

Document Code

Courses			CODE		Course Fa	mily	Cre	dit We	eight	SEMESTER	Compilation Date		
Plant Em	bryo	logy*		4620102059				T=1	L P=1	ECTS=3.18	6	July 17, 2024	
AUTHORIZATION			SP Developer			Cours	Course Cluster Coordinator			Study Program Coordinator			
									Dr. H. Sunu Kuntjoro, S.Si., M.Si.				
Learning model		Case Studies											
Program		PLO study program that is charged to the course											
Learning Outcom (PLO)		PLO-7	PLO-7 Able to work independently and collaboratively, as well as responsibly, in completing various tasks in class, in the laboratory and in the field.										
`		PLO-13		to demonstrate l ze current biolog		ge of cell and	l molecula	ar biol	ogy, or	ganismal biol	ogy, ecology a	nd evolution to	
		Program Objec	tives ((PO)									
		PLO-PO Matrix		· ·									
				P.O PLO-7 PLO			PLO-13						
		PO Matrix at th	e end	of each learni	ng stage (Sı	ıb-PO)							
			P	O Week									
				1 2	3 4	5 6 7	8	9	10	11 12	13 14	15 16	
							1					1	
Short Course Descript	urse Pteridophyta generational transitions include gametogenesis, sporogenesis, and embryogenesis in Psilopsida, Lycc								and Bryopsida; da, Lycopsida, ogenesis, and				
Referen	ces	Main :											
 Evert RF, Eichhorn SE. 2013. Raven biology of plants, 8th ed . New York: W.H. Freeman. Shivanna KR., Sawhney VK. 2005. Pollen Biotechnology for Crop Production and Improvement . New Y University. Maheswari, P. 1975. An Introduction to the Embryology of Angiosperm . New York: McGraw-Hill Book Comp. Vashsista, B.R. 1973. Bryophyta . New Delhi: S. Chand & Company LTD. Vashsista, B.R. 1984. Pteridophyta . New Delhi: S. Chand & Company LTD. Vashsista, B.R. 1984. Pteridophyta . New Delhi: S. Chand & Company LTD. Olsen, Odd-Arne. 2007. Endosperm: Developmental and Molecular Biology . New York: Springer. 													
		Supporters:											
Support lecturer	ing	Dr. Rinie Pratiwi Ahmad Bashri, S											
Week-	eac stag	al abilities of h learning ge b-PO)					Help Learning, Learning methods, Student Assignments, [Estimated time] Offline (offline)			Learning materials References]	Assessment Weight (%)		
(1) (2)				(3)	(4)		(5)			(6)	(7)	(8)	

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a responsible, independent and honest attitude towards reproductive organs of Bryophita. structure and development of male and b rowards organs of Bryophita. male and female performance in performance in 2.Explain the Droper of gametophytes	
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3	Understand and communicate hereditary changes in Pteridophyta Have a responsible, independent and honest attitude towards performance in plant embryology	 Describe the parts that make up the reproductive organs of Pteridophyta. Explain the process of Pteridophyta gametogenesis. Write the results of studies on fertilization and embryogenesis of Pteridophyta. Be present on time according to the lecture schedule Collect assignments on time Actively express opinions during discussions and presentations 	Discussion and preparation of a paper on the structure and development of male and female gametophytes of Pteridophyta Practicum on the structure and development of male and female gametophytes of Pteridophyta 2 X 50		0%
4	Understand and communicate hereditary changes in Pteridophyta Have a responsible, independent and honest attitude towards performance in plant embryology	 Describe the parts that make up the reproductive organs of Pteridophyta. Explain the process of Pteridophyta gametogenesis. Write the results of studies on fertilization and embryogenesis of Pteridophyta. Be present on time according to the lecture schedule Collect assignments on time Actively express opinions during discussions and presentations 	Discussion and preparation of a paper on the structure and development of male and female gametophytes of Pteridophyta Practicum on the structure and development of male and female gametophytes of Pteridophyta 2 X 50		0%

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5	Understand and communicate hereditary changes in Gymnosperm. Have a responsible, independent and honest attitude towards performance in plant embryology.	 Describe the parts that make up the reproductive organs of Gymnosperm. Explain the process of gametogenesis and sporogenesis of Gymnosperm. Write down the results of studies on gymnosperm fertilization and embryogenesis. Communicates Gymnosperm embryonic development. Be present on time according to the lecture schedule. Collect assignments on time. Actively express opinions during discussions and presentations 	Discussion, preparing problem solving papers related to the structure and development of male and female gametophytes Practical about the structure and development of male and female gametophytes 2 X 50		0%
6	Understand and communicate hereditary changes in Gymnosperm. Have a responsible, independent and honest attitude towards performance in plant embryology.	 Describe the parts that make up the reproductive organs of Gymnosperm. Explain the process of gametogenesis of Gymnosperm. Write down the results of studies on gymnosperm fertilization and embryogenesis. Communicates Gymnosperm embryonic development. Be present on time according to the lecture schedule. Collect assignments on time. Actively express opinions during discussions and presentations 	Discussion, preparing problem solving papers related to the structure and development of male and female gametophytes Practical about the structure and development of male and female gametophytes 2 X 50		0%

7	Understand and communicate	1.Describe the parts that make	Discussion, preparing a		0%
	hereditary changes in Angiosperm. Have a responsible, independent and honest attitude towards performance in plant embryology.	up the reproductive organs of Angiospermeae 2.Explain the process of Angiospermeae gametogenesis 3.Write the results of studies on fertilization and embryogenesis of Angiospermeae 4.Communicating the Ontogeny of sporogenesis 5.Describe double fertilization in Angiospermeae 6.Be present on time according to the lecture schedule 7.Collect assignments on time 8.Actively express opinions during discussions and presentations	paper solving problems related to the structure and development of male and female gametophytes of Angiospermeae Practicum on the structure and development of male and female gametophytes of Angiospermeae 2 X 50		
8	MIDDLE SEMESTER EXAMINATION Final skills from meeting 1 to meeting 7	Indicators for meeting 1 to meeting 7	Written Exam 2 X 50		0%
9	Understand and communicate hereditary changes in Angiosperm. Have a responsible, independent and honest attitude towards performance in plant embryology.	 Describe the parts that make up the reproductive organs of Angiospermeae Explain the process of Angiospermeae gametogenesis Write the results of studies on fertilization and embryogenesis of Angiospermeae Communicating the Ontogeny of sporogenesis Describe double fertilization in Angiospermeae Be present on time according to the lecture schedule Collect assignments on time Actively express opinions during discussions and presentations 	Discussion, preparing a paper solving problems related to the structure and development of male and female gametophytes of Angiospermeae Practicum on the structure and development of male and female gametophytes of Angiospermeae 2 X 50		0%

10	Understand and communicate the concept of Angiospermeae embryogenesis. Have a responsible, independent and honest attitude towards performance in plant embryology	 Describe the components of the Angiospermeae embryo Explain the process of Angiospermeae embryo development Write down the results of studies on various experiments on Angiospermeae embryogenesis Be present on time according to the lecture schedule Collect assignments on time Actively express opinions during discussions and presentations 	Discussion, preparing a paper solving problems related to the development of Angiospermeae embryos Practicum on the structure and development of Angiospermeae embryos 2 X 50		0%
11	Understand and communicate the concept of Angiospermeae embryogenesis. Have a responsible, independent and honest attitude towards performance in plant embryology	 Describe the components of the Angiospermeae embryo Explain the process of Angiospermeae embryo development Write down the results of studies on various experiments on Angiospermeae embryogenesis Be present on time according to the lecture schedule Collect assignments on time Actively express opinions during discussions and presentations 	Discussion, preparing a paper solving problems related to the development of Angiospermeae embryos Practicum on the structure and development of Angiospermeae embryos 2 X 50		0%
12	Understand and communicate the concept of endosperm. Have a responsible, independent and honest attitude towards performance in plant embryology.	 Describe the development and types of endosperm. Write down the results of studies on various experiments related to Angiospermeae endosperm Be present on time according to the lecture schedule Collect assignments on time Actively express opinions during discussions and presentations 	Discussion and preparation of a paper about endosperm 2 X 50		0%

14	communicate the concept of endosperm. Have a responsible, independent and honest attitude towards performance in plant embryology.	development and types of endosperm. 2.Write down the results of studies on various experiments related to Angiospermeae endosperm 3.Be present on time according to the lecture schedule 4.Collect assignments on time 5.Actively express opinions during discussions and presentations	preparation of a paper about endosperm 2 X 50 Discussion and		0%
14	communicate the concept of apomixis. Have a responsible, independent and honest attitude towards performance in plant embryology.	 Write down the results of studies related to apomixis Be present on time according to the lecture schedule Collect assignments on time Actively express opinions during discussions and presentations 	Discussion and preparation of a paper on apomixis 2 X 50		0%
15	Understand and communicate the concept of polyembryony. Have a responsible, independent and honest attitude towards performance in plant embryology	 Write down the results of studies related to piliembryoni Be present on time according to the lecture schedule Collect assignments on time Actively express opinions during discussions and presentations 	Discussion and preparation of a paper on polyembryony. 2 X 50		0%
16					0%

 Evaluation Percentage Recap: Case Study

 No
 Evaluation

 Percentage

 0%

Notes

- 1. Learning Outcomes of Study Program Graduates (PLO Study Program) are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
- The PLO imposed on courses are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
- 3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
- 4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
- 5. **Indicators for assessing** ability in the process and student learning outcomes are specific and measurable statements that identify the ability or performance of student learning outcomes accompanied by evidence.

- 6. Assessment Criteria are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
- 7. Forms of assessment: test and non-test.
- Forms of learning: Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
 Learning Methods: Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning,
- Learning Methods: Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
- 10. Learning materials are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
- 11. The assessment weight is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
- 12. TM=Face to face, PT=Structured assignments, BM=Independent study.