



# UNIVERSITAS NEGERI YOGYAKARTA

## FACULTY OF MATHEMATICS AND SCIENCE DEPARTMENT OF BIOLOGY EDUCATION

Colombo 1 Street Yogyakarta 55281

Phone: (0274)565411 Ext. 217, (0274)565411(Administration Office), fax  
(0274)548203

Website:fmipa.uny.ac.id, E-mail :humas\_fmipa@uny.ac.id

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### Bachelor of Science in Biology

### MODULE HANDBOOK

Module name:	Laboratory work in Developmental Biology of Plants
Module level, if applicable:	Undergraduate
Code:	BIM6120
Sub-heading,if applicable:	-
Classes,if applicable:	-
Semester:	Odd
Module coordinator:	Dra. Budiwati, M.Si.
Lecturer(s):	Dra. Budiwati, M.Si.' Dra. Ratnawati, M.Sc., Dr.. Suyitno, Al., M.S.
Language:	Bahasa Indonesia
Classification within the curriculum:	Compulsory Course
Teaching format / class hours per week during the semester:	100 minutes lectures, 120 minutes structured activities, and 120 minutes individual studyper week
Work load:	Total workload is 91 hours per semester which consists of 100 minuteslectures, 120 minutes structured activities, and 120 minutes individual study per weekfor 16 weeks.
Credit points:	1 SKS (2 ECTS)
Prerequisites course(s):	Plant Anatomy; Plant Morphology
Perogram Learning Outcomes:	4. Comprehensively mastering Biology (core biology) to solve problems in the field of Biology (problem-solving) and to underlie the concepts of related sciences 5. Mastering the techniques and methodologies in Biology as well

	<p>as familiar with the equipment used in Biology laboratories in order to get the knowledge of Biology (how we know what we know)</p> <p>6. Being adaptive, creative, innovative in applying the concepts of Biology and other related fields</p> <p>7. Being skillful in applying the techniques used in laboratories and daily life</p> <p>9. Being able to work and create jobs/being an entrepreneur in the field of Biology</p> <p>10. Having managerial ability to supervise and evaluate workers and optimizing the networks in order to develop professionalism</p> <p>11. Possessing scientific skills to support the ability to speak in local, national, and international forums</p>															
Course Outcomes	<p>After taking this course, the students have ability to:</p> <p>CO1. melakukan identifikasi struktur dan fungsi bagian-bagian bunga,</p> <p>CO2. mengidentifikasi struktur dan perkembangan alat reproduksi jantan dan betina tumbuhan Angiospermae ;</p> <p>CO3. mengenal dan memahami proses-proses yang terjadi pada perkembangan tumbuhan;</p> <p>CO4. mengenal bermacam-macam struktur yang membantu penyebaran biji/buah;</p> <p>CO5. mengenal peristiwa poliembrioni,</p> <p>CO6 mengenal cara-cara tumbuhan melakukan reproduksi aseksual.</p> <p>CO7. Memahami poefran cahaya dalam perkevcambahan biji</p> <p>CO8. Memahami perkembangan pigmen daun menurut tingkat umur</p> <p>CO9. mendeterminasi pigmen daun melalui kromatografi</p>															
Content:	<p>Pada praktikum ini mahasiswa melakukan identifikasi struktur dan fungsi bagian-bagian bunga, mengamati struktur dan perkembangan alat reproduksi jantan dan betina tumbuhan Angiospermae ; mengenal dan memahami proses-proses yang terjadi pada perkembangan tumbuhan; mengenal bermacam-macam struktur yang membantu penyebaran biji/buah; mengenal peristiwa poliembrioni, dan mengenal cara-cara tumbuhan melakukan reproduksi aseksual.</p>															
Study/exam achievements:	<p>The final mark will be weight as follow:</p> <table border="1"> <thead> <tr> <th>No</th> <th>CO</th> <th>Assessment Object</th> <th>Assessment Technique</th> <th>Weight</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CO1 to CO9</td> <td>Observed attitudes , knolwedge, and skills</td> <td>Survey, test, rubrics and manuals</td> <td>100%</td> </tr> <tr> <td colspan="4">Total</td> <td>100%</td> </tr> </tbody> </table>	No	CO	Assessment Object	Assessment Technique	Weight	1	CO1 to CO9	Observed attitudes , knolwedge, and skills	Survey, test, rubrics and manuals	100%	Total				100%
No	CO	Assessment Object	Assessment Technique	Weight												
1	CO1 to CO9	Observed attitudes , knolwedge, and skills	Survey, test, rubrics and manuals	100%												
Total				100%												
Forms of media:	Real objects, model, multimedia															
Reference:	A.Bhojwani, S.S. and S.P.Bhatnagar. 1999. <b>The Embryology of</b>															

	<p><b>Angiosperms.</b> New Delhi : Vikas Publishing House PVT. Ltd.</p> <p>B.Bidwell R.G.S. 1979. 1979. Plant Physiology. Collier MacMillan Publ.Comp. NY</p> <p>C. Foster and Gifford. 1974. <b>Comparative Morphology.</b> San Francisco : Vicas Publisher</p> <p>D. Hartmann, H.T., Kester, D.E, Davies, F.T. and R.L.Geneve. 1997. <b>Plant Propagation-Principles and Practice.</b> New Jersey: Prentice Hall International, Inc.</p> <p>E. Johri,B.M. (Ed). 1984. <b>Embryology of Angiosperms.</b> Springer-Verlag : Berlin, Heidelberg. New York</p> <p>F.Jorge J. Casal* and Marcelo J. Yanovsky. (2005). Regulation of gene expression by light. <i>Int. J. Dev. Biol.</i> <b>49</b>: 501-511. doi: 10.1387/ijdb.051973jc</p> <p>G. Kai Shu, Xiao-dong Liu, Qi Xie,* and Zu-hua He,* (2016). (Review) Two Faces of One Seed: Hormonal Regulation of Dormancy and Germination. <i>Molecular Plant</i> 9, 34–45,.</p> <p>H. Lersten, N.R. (2004). <i>Flowering Plant Embryology.</i> Victoria: Blackwell Publishing</p> <p>I. Salisbury,F.B and C.W. Ross. 1992. <b>Plant Physiology.</b> 4<sup>th</sup> Ed. California. Wadsworth Publ. Co.</p> <p>J. Tjitrosoepomo, G. 1990. <b>Morfologi Tumbuhan.</b> Yogyakarta: Gadjah Mada University Press.</p> <p>K. Tjitrosoepomo, G. 1991. <b>Taksonomi Tumbuhan (Spermatophyta).</b> Yogyakarta: Gadjah Mada University Press.</p>
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**PLO and CO mapping**

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11
C01				✓	✓						
C02				✓	✓						
C03				✓	✓						
C04				✓	✓						
C05				✓	✓						
C06				✓	✓	✓					
C07				✓	✓	✓		✓			
C08				✓	✓	✓			✓	✓	
C09				✓	✓	✓					✓