



**UNIVERSITAS NEGERI YOGYAKARTA**  
**FACULTY OF MATHEMATICS AND SCIENCE**  
**DEPARTMENT OF BIOLOGY EDUCATION**  
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**Bachelor of Science in Biology**

**MODULE HANDBOOK**

Module name:	Laboratory Work in Plant Anatomy
Module level, if applicable:	Undergraduate
Code:	BIO6102
Sub-heading,if applicable:	-
Classes,if applicable:	-
Semester:	Odd
Module coordinator:	Ratnawati, MSc.
Lecturer(s):	Budiwati, MSi., Ratnawati, MSc.
Language:	Bahasa Indonesia
Classification within the curriculum:	Compulsory Course
Teaching format / class hours per week during the semester:	100 minutes for lecture, 120 minutes for structured activities, and 120 minutes for individual study per week.
Work load:	Total workload is 91 hours per semester consisting of 100 minutes lecture, 120 minutes for structured activities, and 120 minutes for individual study per week for 16 weeks.
Credit points:	1 SKS (2 ECTS)
Prerequisites course(s):	-
Program Learning Outcomes:	<ol style="list-style-type: none"> <li>4. Comprehensively mastering Biology (core biology) to solve problems in the field of Biology (problem-solving) and to underlie the concepts of related sciences.</li> <li>5. Mastering the techniques and methodologies in Biology as well as familiar with the equipment used in Biology laboratories in order to get the knowledge of Biology (how we know what we know).</li> <li>6. Being adaptive, creative, innovative in applying the concepts of Biology and other related fields</li> <li>7. Being skillful in applying the techniques used in laboratories and daily life</li> <li>9. Being able to work and create jobs/being an entrepreneur in the field of Biology.</li> </ol>

	<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 attending this subject students are able to:</p> <p>CO1. Make the section as thin as possible manually.</p> <p>CO2. Make fresh preparation slides</p> <p>CO3. Recognise the cell components among various cells.</p> <p>CO4. Recognise the structure and composition of cells among various tissues.</p> <p>CO5. Compare the structure of tissues among various organs.</p> <p>CO6. Observe the structure of anomalous organs.</p> <p>CO7. Observe the adapting structures of plants.</p> <p>CO8. Observe the structure of economic plants.</p> <p>CO9. Present the results of selected objects.</p>																									
Content:	<p>This subject mostly recognising the structure and development of cells and some observed organelles, meristem, epidermis, parenchyme, strengthening, and vascular tissues of Spermatophytes. The understanding about these structures will be the basic knowledge to compare among the structure of organs, between the organ structures in Dicots/Gymnosperms and the ones in Monocots, between the anomalous structural of organs with the normal ones, and among the adaptive structures, and some selected subjects.</p>																									
Study/exam achievements:	<p>The final mark will be weighted as follows:</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>CO3 to CO9</td> <td>Knowledge</td> <td>Written Test</td> <td>25%</td> </tr> <tr> <td>2</td> <td>CO3 to CO9</td> <td>Knowledge</td> <td>Observation Test</td> <td>50%</td> </tr> <tr> <td>3</td> <td>CO1 and CO2</td> <td>Skill, knowledge and attitude.</td> <td>Observation, peer assesment.</td> <td>25%</td> </tr> <tr> <td colspan="4">Total</td> <td>100%</td> </tr> </tbody> </table>	No	CO	Assessment Object	Assessment Technique	Weight	1	CO3 to CO9	Knowledge	Written Test	25%	2	CO3 to CO9	Knowledge	Observation Test	50%	3	CO1 and CO2	Skill, knowledge and attitude.	Observation, peer assesment.	25%	Total				100%
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3	CO1 and CO2	Skill, knowledge and attitude.	Observation, peer assesment.	25%																						
Total				100%																						
Forms of media:	Real objects, microscopic slides, model, and multimedia.																									
References:	<ol style="list-style-type: none"> <li>Esau, K (1992). <i>Anatomy of Seed Plants 2<sup>nd</sup></i>. John Wiley and Sons, New York.</li> <li>Estiti Hidayat. 1991. <i>Anatomi Tumbuhan Berbiji</i>. Bandung: Institut Teknologi Bandung.</li> <li>Fahn, A, 1990. <i>Plant Anatomy</i>. 4<sup>th</sup>. edit Pergamon. New York.</li> <li>Karp, G. 1984. <i>Cell Biology</i>, 2<sup>nd</sup> ed, McGraw-Hill Book Co., New York.</li> <li>Sheeler and Bianchi. 1983. <i>Cell Biology, Structure, Biochemistry and Function</i>. New York.</li> </ol>																									

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**PLO and CO mapping**

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11
CO1					√		√			√	
CO2					√		√			√	
CO3				√							
CO4				√							
CO5				√							
CO6				√							
CO7				√		√					
CO8				√		√			√		
CO9				√							√