



# THE MODULE HANDBOOK

## FACULTY OF BIOLOGY

### Plant Microtechnique

<b>Module code</b>	BID 20603IUP
<b>Module level</b>	Undergraduate
<b>Abbreviation, if applicable</b>	-
<b>Sub-heading, if applicable</b>	-
<b>Courses included in the module, if applicable</b>	-
<b>Semester/ term</b>	Odd
<b>Module coordinator(s)</b>	Dr. Suharyanto
<b>Lecture(s)</b>	Dr. Suharyanto
<b>Language</b>	English
<b>Classification within the Curriculum</b>	<ol style="list-style-type: none"><li>1. Elective</li><li>2. This subject consists of the comprehension of basic concepts, principles and theories related to the microscope and plant microscopic slides preparations</li></ol>
<b>Teaching format/ class hours per week during the semester</b>	Plant Microtechnique Course is given on the odd and even semester to S1 regular students in Faculty of Biology. Each week there are 1 meetings with time allocation of 50 minutes (Monday, at 12.00- 12.50 am) and 1 meeting of laboratory works.
<b>Workload</b>	This course consists of 1 credits of theory and 1 credit of laboratory works.
<b>Credit points</b>	1-1credits
<b>Requirements</b>	Plant Structure and Development (BIB 10601IUP)
<b>Learning goals/ competencies</b>	<p><b>1. Knowledge and understanding</b> Students have knowledge and understanding on:</p> <ol style="list-style-type: none"><li>a. The basic principle of physics associated with the microscope.</li><li>b. The basic principles of chemistry associated with the process of anatomical slides preparation.</li><li>c. The principles and theories related to the structure and development of plants.</li><li>d. The basic procedure in anatomical slides preparation, so the students are able to explain that procedure.</li><li>e. The role of Plant Microtechnique on the understanding of Biological Sciences.</li></ol> <p><b>2. Ability/intellectual skill</b></p>



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	<p>Students have abilities to:</p> <ol style="list-style-type: none"><li>Plan, implement and report a basic procedure in anatomical slides preparation.</li><li>Analyze and solve a problem and develop a draft basic procedures in anatomical slides preparation.</li><li>Integrate and evaluate information on the basic procedures in the anatomical slides preparation from various sources.</li></ol> <p><b>3. Practical skill</b></p> <p>Students have practical skills to:</p> <ol style="list-style-type: none"><li>Plan and implement anatomical slides preparation.</li><li>Design and use laboratory equipments.</li><li>Analyze the results of slides preparation especially on its failure and how to solve the problem.</li><li>Use scientific references.</li><li>Create and present technical reports scientifically.</li></ol> <p><b>4. Managerial and transferable skill</b></p> <p>Students have managerial and transferable skills to:</p> <ol style="list-style-type: none"><li>Communicate effectively (written, oral and picture).</li><li>Apply physical and chemical principles in the field of Plant Microtechnique.</li><li>Work in group.</li><li>Apply and integrate Plant Microtechnique in Biological sciences.</li><li>Use communication and information effectively.</li><li>Arrange time resource effectively and efficiently.</li><li>Study individually and effectively to develop professional work.</li></ol> <p><b>5. Attitude</b></p> <p>Students have attitudes to be:</p> <ol style="list-style-type: none"><li>Able to anticipate problems and find out problem solution related to Plant Microtechnique.</li><li>Having curiosity.</li><li>Sensitive on changes and problems related to Plant Microtechnique and able to find out solution.</li></ol>
<b>Content</b>	<p>This subject consists of the comprehension of basic concepts, principles and theories related to the microscope and plant microscopic slides preparations. The topics of this subject consists of the use of equipment (microscopes, microtomes ); microscopic slides preparation; observing, measuring, counting, photographing the components of cells, tissues or organs in plants.</p>
<b>Study/ exam achievements</b>	<ol style="list-style-type: none"><li><b>Theory:</b> midterm (35%), final examination (45%), tasks(20%)</li><li><b>Laboratory work:</b> pretest(30%), practical report (30%), practical examination (40%).</li></ol>



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Forms of media	White board, LCD
Literature	<ol style="list-style-type: none"><li>1. Dickison, W. C.; J. R. Massey and C. R. Bell. 1974. <i>Vascular Plant Sytematics</i>. New York, Evanson, San Fransisco, London. Harper &amp; Row Publishers. P. 247-257.</li><li>2. Erdtman, G. 1952. <i>Pollen Morphology And Plant Taxonomy. Angiosperms (An Introduction toPalinology I)</i>. Stockholm. Almqvist&amp;Wiksell. p.6-9.</li><li>3. Johansen, D. A. 1940. <i>Plant Microtechnique</i>. New York And London. Mc Graw-Hill Book Company, Inc. p.102-169.</li><li>4. Lamberg, S. L. &amp; R. Rothstein. 1978. <i>Laboratory Manual of Histology And Histology And Cytology</i>. Wessport, Connecticut. Avi Publishers, Inc. p.1-97.</li><li>5. Mizoguti, H.1991. <i>The Principles and Practice of Photomicroscopy</i>. Tokyo, Japan. Published by Olympus Optical Co. Ltd. p.1-6.</li><li>6. Ruzin, S. E. 1999. <i>Plant Microtecnique and microscopy</i>. New York. Oxford. Oxford University Press. p. 9-119.</li><li>7. Wallis, T. E. 1957. <i>Analytical Microscopy</i>. Boston . Little, Brown And Company. p. 149-152.</li><li>8. Berlyn, G.P. &amp; J. P. Miksche. 1976. <i>Botanical Microtechnique And Cytochemistry</i>. Ames, Iowa. The Iowa State University Press. P.16-239.</li><li>9. Gray, P. 1954. <i>The Microtomist's Formulary and Guide</i>. New York. Toronto. The Blakiston Company, Inc. p.94-128.</li><li>10. Jahier. J.; A. M. Chevre; F. Eber; R. Delourme and A. M. Tanguy.1996. <i>Technique of Plant Cytogenetics</i>. USA. Science Publishers, Inc. p.3-30.</li><li>11. Sass, J. E. 1958. <i>Botanical Microtechnique</i>. Ames, Iowa. The Iowa State University Press. p. 12-109.</li><li>12. Wolfe, S.L. 1993. <i>Molecular And Cellular Biology</i>. Belmont, California. Wadsworth Publishing Company, Inc. p. 108-116.</li></ol>