



THE MODULE HANDBOOK

FACULTY OF BIOLOGY

Plant Physiology

Module code	BID 30901IUP
Module level	3 rd year of undergraduate program in Biology
Abbreviation, if applicable	-
Sub-heading, if applicable	-
Courses included in the module, if applicable	-
Semester/term	Odd
Module coordinator(s)	Dr. Diah Rachmawati, S.Si., M.Si.
Lecture(s)	1. Dr. Diah Rachmawati, S.Si., M.Si.
Language	English
Classification within the Curriculum	Elective
Teaching format/ class hours per week during the semester	This course is given on the fifth semester to S1 regular students in Faculty of Biology. Each week there is one meeting with time allocation of 100 minutes.
Workload	Estimated working hour: two credits of theory and one credit of laboratory work.
Credit points	2-1 credits
Requirements	Plant Physiology (BIB 20901IUP)
Learning goals/ competencies	<ol style="list-style-type: none">1. Knowledge and understanding<ol style="list-style-type: none">a. The basic concept, principal and theory related to plant primary metabolism and secondary metabolism as well as the factors that influenceb. Basic theory and instrumentation to carry out scientific research related to plant primary metabolism and secondary metabolism.c. The relationship between changes of physiological processes and productivity (Biological and Economic Yield) and secondary metabolism.d. The biological phenomenon of plant productivity and synthesis of secondary metabolites as part of natural selection.e. The role of plant primary and secondary metabolites to food security and the provision of alternative drugs that lower the negative impact.2. Ability/intellectual skill



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- a. Plan, implement, and report of study on plant primary and secondary metabolism.
- b. Analyze and resolve problems and develop a plan of activities of plant primary and secondary metabolism
- c. Formulate a hypothesis related to the plant primary and secondary metabolism.
- d. Integrate and evaluate information and data from various sources of physiological processes related to primary metabolism and secondary metabolism in plants.
- e. Conduct a holistic approach to the problem of food security and alternative medicine resource extraction from plants.

3. Practical skill

- a. Plan and implement validity an experiment/research on plant primary and secondary
- b. Design and use of laboratory and field equipment in solving problems related to plant primary and secondary metabolites.
- c. Analyze the results of experiments on plant primary and secondary metabolites
- d. Using the scientific literature about plant primary and secondary metabolites and make notes effectively.
- e. Create and present a scientific report on plant primary and secondary metabolites.

4. Managerial and transferable skill

- a. Communicate effectively in the field of biology that uses the basic plant physiology.
- b. Working in groups to solve the problems on plant productivity and secondary metabolism.
- c. Applying and integrating knowledge about plant productivity and secondary metabolism in the biological sciences.
- d. Using information and communication technology in the field of plant productivity and secondary metabolism effectively.
- e. Set the time and resources effectively and efficiently.
- f. Learning independently and effectively for professional development and in pursuing a career in a field related to plant productivity and secondary metabolism.

5. Attitude



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	<ol style="list-style-type: none">a. Being able to anticipate problems and find a way of solving problems related to plant primary and secondary metabolism and productivity.b. Have a curiosity.c. Respect interdisciplinary efforts in exploring, exploiting and preserving natural resources.d. Having an entrepreneurial spirit.e. Being able to appreciate the views and opinions of others/team members.
Content	<p>Advanced Plant Physiology course focused on the primary metabolism associated with the synthesis, accumulation, allocation and partitions as well as the factors influencing plant productivity. Biosynthesis and function of secondary metabolites for plants that synthesize and for other organisms as well as the role of biotechnology to increase plant productivity and secondary metabolites. This course accompanied by practical purpose work to provide a more real understanding of the basic concepts of primary and secondary metabolism in plants. Thus, students are able to analyze and solve problems and develop design and research activities related to productivity and secondary metabolites of plant. Advanced Plant Physiology course apply learning methods Student-Centered Learning (SCL) and e-learning which is expected to enhance the understanding of students on learning materials, student participation and improve self-learning ability, and improve the learning quality.</p>
Study/exam achievements	<ol style="list-style-type: none">1. Theory<ol style="list-style-type: none">a. Midterm: 30 %b. Final examination: 30 %c. Quiz: 10 %d. Self-study report: 15 %e. Work group activity: 15 %2. Laboratory work<ol style="list-style-type: none">a. Pretest: 20 %b. Posttest: 30 %c. Final report evaluation: 40 %d. Attendance in laboratory work: 10 %
Forms of media	White board, LCD, notebook.
Literature	<ol style="list-style-type: none">1. Hopkins, W.G. 2004. Introduction to Plant Physiology 3rd Ed. John Wiley & Sons, Inc. New York, Brisbane, Singapore.2. Taiz, L. and E. Zieger. 2003. Plant Physiology 3rd Ed. Sinauer Associates, Inc., Publisher. Sunderland, Massachusetts.



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3. Mohr, H. and P. Schopfer. 1995. Plant Physiology. Translated by: Gudrun and D.W. Lawlor. Springer-Verlag. Berlin, Heidelberg, New York.
 4. Smirnov, N. 1995. Environment and Plant Metabolism: Flexibility and Acclimation. BIOS Scientific Publishers Limited. Oxford. UK.
 5. Pessarakli, M. 1995. Handbook of Plant and Crop Physiology. Marcel Dekker Inc. New York, Basel, Hongkong.
 6. Recheigel Jr. 1982. CRC Handbook of Agricultural Productivity. Volume I: Plant Productivity. CRC Press Inc. Florida.
 7. Foyer, C.H. and Quick, W.P. 1997. A Molecular Approach to Primary Metabolism in Higher Plants. Taylor & Francis . UK.
 8. Plaxton, W.C. and McManus M.T. 2006. Control of Primary Metabolism in Plants. Blackwell Publishing Ltd.
 9. Acquaah, G. 2007. Principles of Plant Genetics and Breeding. Blackwell Publishing,
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