



THE MODULE HANDBOOK

Magister Biology Study Program

FACULTY OF BIOLOGY

SYSTEMATIC RESEARCH METHODS

Course code	BIMB202119
Course level	Magister
Semester/ term	Odd
Course coordinator(s)	Dr. Endah Retnaingrum, M. Eng
Lecture(s)	1. Dr. Endah Retnaingrum, M. Eng 2. Prof. Dr. Budi Setiadi Daryono, M. Agr. Sc 3. Prof. Dr. Purnomo, M. S 4. Dra. Tuty Arisuryanti, M.Sc., Ph.D
Language	English
Classification within the Curriculum	Compulsory Subjects for Study Program Interests
Teaching format/ class hours per week during the semester	This course is organized into 14 teaching weeks and 2 weeks of examination.
Workload	Estimated working hour: 2 credits of theory and 1 credit of laboratory work.
Credits	2-1 credits
Requirements	-
Program Learning Outcome	KN2: The graduates are demonstrating knowledge and comprehend biological system and bio-engineering methods to solve tropical biodiversity problems (Knowledge); GS1: The graduates are able to develop logical, critical, systematic, and creative thinking through scientific concept and research (General Skills); SS2: The graduates are able to solve problems related to biological resources through an inter- and / or multidisciplinary approaches beneficial to society and scientific community (Specific Skills).
Course Learning Outcome	CPMK1: Students are able to characterize, classify and identify both phenotypically and genotypically cellular microbes, acellular microbes (viruses), plants and animals CPMK2: Students are able to understand and to choose an appropriate technique for systematic research method and used them for applying CPMK3: Students are able to process phenotypic and genotypic data on organisms for identification, preparation of dendrogram and phylogenetic trees CPMK4: Students are able to apply theory in systematic research methods to solve problems related to the



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	diversity of organisms in various environments, as well as detect the origin or distribution of organisms between the archipelagos or between countries in the world.
Course Description	<p>This course studies research methods in studying the systematics of living things including animals, plants and cellular microorganisms (prokaryotic, eukaryotic) and acellular types (viruses). Study and overall practice of methods in systematic research analysis are given to students, which include analysis of phenotypic and genotypic characters of organisms. This field of study has an important role in producing useful information about the organisms under study. Phenotypic characterization methods of organisms are given and studied to students which include morphological, metabolic and chemical analyses. Meanwhile, genotype characterization methods include fingerprinting techniques and sequencing of organism DNA markers. The results of characterization, both phenotypic and genotypic characters, are processed by comparing test organisms or databases in systematics in order to obtain formulations for determining the findings of rare and new (novel) organisms that are useful in applications.</p>
Assesments	<ol style="list-style-type: none">1. Quiz : 52. Assignment 103. Midterm exam : 404. Final exam 40
	Notebook and LCD
Literature	<ol style="list-style-type: none">1. Brown, J. W. Principal of Microbial Diversity. Copyright © 2015 American Society for Microbiology, California, USA.2. Caugant, D.A. 2009. Molecular Epidemiology of Microorganisms. Springer Dordrecht Heidelberg London New York3. Clive A. Stace, 2005. Plant Taxonomy and Biosystematics. 2nd Edition, University of Leicester. Cambridge University Press.4. Gubrahan Singh, 2004. Plant Systematik an Integrated Approach. Science Publisher Inc.5. King, A.M.Q., M.J. Adams, E.B. Carstens, and E.J. Lefkowitz. 2011. Molecular Taxonomy. Elsevier. Oxford (UK)6. Lefkowitz, E.J., D.M. Dempsey, R.C. Hendrickson, R.J. Orton, S. G. Siddell, and D.B. Smith. 2018. Virus taxonomy: the database of the International Committee on Taxonomy of Viruses (ICTV). Nucleic Acid Research. 46:708-7177. Michael G. Simson, 2006. Plant Systematics. Elsevier Academic Press.8. Modrow, S., D. Falke, U. Truyen, and H. Schatzl. 2013. Molecular Virology. Springer. London (UK)



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9. Sap, J. 2005. Microbial Phylogeny and Evolution Concepts and Controversies. Published by Oxford University Press, Inc. 198 Madison Avenue, New York, New York
 10. Stackebrandt, E. 2006 Molecular Identification, Systematics, and Population Structure of Prokaryotes. Springer-Verlag Berlin Heidelberg. Germany
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