

Bachelor of BiologyEmail: biologi.fmipa@um.ac.idWebsite: <http://biologi.fmipa.um.ac.id/>**MODULE HANDBOOK**

Module designation	Evolution
Module level, if applicable	Undergraduate
Code, if applicable	NBIOUM6127
Subtitle, if applicable	-
Courses, if applicable	-
Semester(s) in which the module is taught	Odd semester
Person responsible for the module	Siti Imroatul Maslikah, S.Si, M.Si
Lecturer	Prof. Dr. Abdul Gofur, M.Si Prof.Dr. Moh. Amin, M.Si Siti Imroatul Maslikah, S.Si, M.Si Fauzi Akhbar Anugrah, S.Si, M.Si Indra Kurniawan Saputra, S.Si, M.Si
Language	Bahasa Indonesia
Relation to curriculum	Undergraduate degree program, Compulsory, 7rd Semester
Type of teaching, contact hours	Undergraduate degree program: cooperative learning, exercises and assignments, private study, 2 x 50 = 100 minutes, 1 x 170 minutes
Workload	Metode pembelajaran : ceramah, diskusi, penugasan, presentasi makalah, analisis jurnal SKS/JS : 2/2 2 x 50 minutes lecturer = 100 minutes 2 x 60 minutes Assignment = 120 minutes 2 x 60 minutes private study = 120 minutes
Credit points	2 credit points (~3 ECTS-eq)
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to be eligible for the final examination.
Recommended prerequisites	Biochemistry Cell Biology Plant Diversity
Module objectives/intended learning outcomes	Students are able to: - (LO3) Master the basic concept of science and the scientific procedure to find and analyze problem/natural phenomena in fields of science with the approach of science and

	technology that is done carefully, critically, and systematically - (LO4) Master the theoretical concept and basic procedure in Biology also the laboratory management that is integrated by using logical, critical, and systematic thinking.
Course Learning Outcomes	1. Mastering basic biological theoretical concepts in an integrated manner by using sources of knowledge (verse Kauliyah and Kauniyah) accompanied by logical, critical, systematic and innovative thinking to analyze various evolutionary problems in society. 2. Mastering the concepts, principles, and procedures of the field of evolution that are integrated with the basic concepts of cell biology, genetics, physiology, animal development to provide scientific solutions as a basis for overcoming problems in society. 3. Designing scientific data-based investigations independently, creatively and innovatively by finding, analyzing, and solving problems in the field of evolution comprehensively
Content	This course covers the following main topics: ● Kauliyah verses and kauniyah verses and their relationship with controversies in the field of evolution. ● The general conceptual relationship between physical, chemical and biological evolution is to formulate the concept of biological evolution by referring to the latest scientific developments and data ● Physical, chemical and biological evolution and their explanation ● Experts' approaches to evolution: ○ Population geneticist ○ Ecologist ○ Systematic expert ○ Molecular evolutionist ○ Paleontologist ● Development of the theory of evolution (pre Darwin, Darwin and post Darwin) ● Evidence and evidence for evolution, Analysis of fossils and biodiversity ● Microevolutionary concept ● Variability: The concept of variability, phenotypic variation (adaptive variation) and genotypic variation ● Recombination: Mutation ● Variation (dynamics) of genes in populations: Hardy Weinberg's Laws of Evolution ● Speciation: Species concept, speciation, speciation model ● Molecular Evolution: Concept, principles and procedures for molecular evolution ● Macroevolution ● Theory of Evolution of Biology and Religion

Learning Outcomes	Week 1	- Finding the source of the problem why there is controversy in the study of evolution associated with the source of science - Analyzing the source of the problems arising from the controversy in the discussion of evolution and finding the right concept of evolution according to scientific references
	Week 2	- Summarizing, making questions and sharing the results of studies about the scientific approach to studying evolution - Utilizing information technology to conduct a study of the scientific approach to studying evolution
	Week 3	- Summarizing, making questions and communicating the principles of each evolutionary theory that has been and is being developed and looking for best practices from the analysis of each principle of the evolutionary theory - Utilizing information technology to solve problems given by lecturers related to the concept of development of the theory of evolution
	Week 4	- Writing papers, asking questions and communicating concepts and principles related to evidence and evidence for evolution - Utilizing information technology to solve problems given by lecturers related to concepts related to evolutionary clues and evidence along with relevant examples
	Week 5	- Writing papers, asking questions and communicating the concepts and principles of microevolution and gene dynamics in populations and their relation to the concept of evolution - Utilizing information technology to solve problems given by lecturers related to the concept of microevolution and gene dynamics in populations and its relation to the concept of evolution
	Week 6	- Exemplifying and communicating the application of Hardy Weinberg's Law to evolutionary analysis and other relevant fields - Utilizing information technology to solve problems given by lecturers related to the application of Hardy Weinberg Law for evolutionary analysis and other relevant fields
	Week 7	- Writing papers, asking questions and communicating concepts related to speciation - Utilizing information technology to solve problems given by lecturers related to speciation
	Week 8	MIDTERM EXAMINATION

	Week 9	- Writing papers, asking questions and communicating concepts, principles and procedures about molecular evolution - Utilizing information technology to solve problems given by lecturers regarding molecular evolution
	Week 10	- Reading, summarizing, asking questions and communicating macroevolution as an approach to studying evolution - Utilizing information technology to solve problems given by lecturers related to macroevolution as an approach to studying evolution
	Week 11	- Reading, summarizing, and communicating the results of the study of the concept of evolution from various points of view of the approach of experts as the embodiment of the study of the Kauniyah verse and the religious point of view as the embodiment of the study of the Kauliyah verse. - Analyzing a number of publication sources that tend to trigger controversy in the community through scientific studies based on scientific references to reduce controversy. - Utilizing information technology to solve problems given by lecturers regarding the discussion of the area of evolution and the area of religion
	Week 12	FINAL EXAMINATION
	Week 13	- Opening the website: ncbi.nlm.nih.gov and the relevant web to access journals relevant to the given assignment - Searching and analyzing journals related to sub-CP discussed and communicate individually
	Week 14	- Focus group discussions in class to solve problems - Reporting the results of tracking journal articles that are relevant to the given task
	Week 15	- Developing interview guidelines related to understanding the evolution of teachers and students - Student task: conducting interviews with teachers and students regarding the understanding of evolution
	Week 16	Focus group discussion to communicate interview results
Study and examination requirements and forms of examination	Final Examination: 30% Midterm Examination: 30% Structured Tasks: 20%	

	Performance or presentation: 15% Activity: 15%
Media employed	LCD, whiteboard, and moodle (Sipejar).
Reading list	1. Clark, D.P. 2005. <i>Molecular Biology Understanding the Genetic Revolution (Chapter 20: Molecular Evolution)</i>. Elsevier. 2. Graur, D. 1999. <i>Molecular Evolution</i>. Sunderland: Sinauer Associates, Inc., PO Box 407 3. Stearn, S.C. and Hoeckstra, R.F. 2003. <i>Evolution: An Introduction</i>. Oxford University Press. 4. Widodo, Lestari, U., Amin, M. 2009. <i>Evolusi</i>. FMIPA UM 5. Website: ncbi.nlm.nih.gov.
Date of last amendment made	January, 2022