

Building D 3rd Floor FTTE UNS Jl Ir. Sutami No. 36 A Kentingan Surakarta 57126 Indonesia

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Module Handbook

Evolution

Undergraduate Programme in Biology Education

Module Name:	Evolution (Evolusi)
Module Level:	Undergraduate Programme
Course Code:	02013242010
Abbreviation, if	-
applicable:	
Courses included in the	-
module, if applicable:	
Semester/Term:	4 th
Module coordinator(s)	Dr. Slamet Santosa
Lecturer(s)	Joko Ariyanto, M.Si.
Language	Bahasa Indonesia (Indonesian Language)
Classification within the	Compulsory/ Elective

curriculum: Teaching format/class hours per week during Direct instruction/face to face/blended learning: 26.7 hours / Week / semester : lecture, discussion

Structured Activity: 32 hours / Week / semester (Through the case method with analysis of journal articles, students learn living things evolution, genetic and molecular evolution, and natural selection) **Self-study Activity:** 32 hours / Week / semester (Students learn how does the evolution process run until nowadays from various sources)

Workload

semester

Type	CSU	Face to Face	Structured Activities	Self-study	
T	2	26.7h (0.88	32h (1.06	32h (1.06	
		ECTS)	ECTS)	ECTS)	
Total	2	90,7 h (3 ECTS)			



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Credit Points:	2 CSU (3 ECTS)			
Requirements:	-			
Learning				
goals/competencies:	PLO 2: They are able to apply the basic advance knowledge in			
	biology to solve the problem in biology.			
	PLO10: They are able to demonstrate creativity, accuracy,			
	discipline, responsibility, adaptability, have an independent			
	initiative, autonomous learning, and do lifelong learning			
	CLO 1			
	Through the study of literature, students are Able to			
	communicate in writing the concept of evolution			
	CLO 2			
	Through Team Based Project, students are able to			
	communicate verbally and argumentatively sharing forms of			
	organic evolution based on sangiran field studies and other			
	sources CLO 3			
	Through discussion, students are able Able to communicate			
	search results and analysis of genetic and molecular data			
	information in evolutionary studies			
	CLO 4			
	Through class presentations, students are able to communicate			
	the concept of gene interaction of living things and the			
	environment related to evolution			
	CLO/ P			
	CLO1 * CLO2 *			
	CLO3 *			
	CLO4 *			
Content	Understanding evolution, Modern theory of evolution,			
	The Meaning of evolution,			



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	 Evolution: Theory, fact, path. Misconscient evolution, How to teach evolution Evidence of evolution Mechanism of Evolution Plant Evolution Animal Evolution Microorganism Evolution Genetic and Molecular Evolution Natural selection and Adaptation Evolution and environment 	onceptions in		
Attribute Soft skill	Students are able to think conceptually, logically, critically, and analytically to examine various chemistry learning strategies. Students are able to collaborate and communicate well to present the resulting project. Students are able to conduct literature studies Students are able to produce products for evolutionary learning/teaching			
Study/exam achievements:	Students are required to attend the face-to-face lecture minimum 75% to be able to take the Mid and Final exam. It is considered to complete the course and pass if students obtain at least 60% of maximum final score. The final score (FS) is calculated based on the following ratio:			
	Aspect(%)Report of Case analysis30Participation and Project30Mid-Term Test20Final Exam20Final Score100			
Forms of Media	Laptop, internet, PPT, LCD, SPADA			



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Literature: 1.	Pierre J. Lena, 2009. The	Tea
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- eaching of Evolution, Scientific Insights into the Evolution of the Universe and of Life
- 2. 2012, The University of California Museum of Paleontology, Berkeley, and the Regents of the University of California
- 3. Kristin Cook, Gayle Buck and Meredith Park Rogers, 2012. Preparing Biology Teachers to Teach Evolution in a Project-Based Approach, Science Educator. Winter 2012 Vol. 21, No. 2
- 4. Stephen C. Meyer and Michael Newton Keas, 2011. The Meanings of Evolution, https://www.researchgate.net/publication/238529368
- 5. Ulrich Kutschera · Karl J. Niklas, 2004. The modern theory of biological evolution: an expanded synthesis. Naturwissenschaften (2004) 91:255-276
- 6. James R Hofmannni and Bruce H Weber, 2003. The Fact of Evolution: Implications for Science Education, Science & Education 12: 729-760, Kluwer Academic Publishers
- 7. Alice Robert, 2011, Evolution: The Human Story, DK Publishing, 375 Hudson Street, New York.
- 8. Susan Middleton and Mary Ellen hannibal, 2009, Evidence of Evolution, www.abramsbook.com
- 9. Valentine, J.W, and Thompson Keith, S. 2020. Animal Evolution. Mc. Graw Hills.
- 10. Song, A. N. (2012). Evolusi fotosintesis pada tumbuhan. Jurnal Ilmiah Sains, 12(1), 28-34. DOI:https://doi.org/10.35799/jis.12.1.2012.398
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- 13. in plant biology, 15(2), 115-121. DOI:10.1016/j.pbi.2012.03.006.
- 14. Dong, Y., et.al. (2019). Natural selection and repeated
- 15. patterns of molecular evolution following allopatric
- 16. divergence. Elife, 8, e45199. DOI:https://doi.org/10.7554/eLife.45199
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Engels(1820-1895) tentang Alur Evolusi Manusia dan Peran Kerja di Dalamnya. Antropologi Indonesia, 32(1). DOI:10.7454/ai.v32i1.2112
18. H. Allen Orr, 2005. THE GENETIC THEORY OF ADAPTATION: A BRIEF HISTORY, Nature Publishing Group, FEBRUARY 2005 VOLUME 6

Assessment

Presentation Assessment Rubric

Dimension	Weight	Scor e	WxS	Comments
Material mastery	30%			
The accuracy of solving the problem	30%			
Communication skills	20%			
Ability to deal with questions	10%			
Props/presentations	10%			
Final Score	100%			

DIMENCI	Scale				
DIMENSI ON	Very Good	Good	Sufficient	Deficient	Very Deficient
ON	≥85	71-84	60-70	40-59	<40
Organisati on	Well organized by presenting facts that are supported by examples that have been analyzed according to the concept	well organized and present convincing facts to support conclusions.	The presentation has focus and presents some evidence to support the conclusion	Sufficiently focused, but insufficient evidence to be used in drawing conclusions	There is no clear organization. Facts are not used to support statements.
Content	Content can inspire listeners to develop their minds.			The content is less accurate, because there is no factual data, it does not add to the listener's understanding	The content is inaccurate or too general. Listeners don't learn anything or are sometimes misled.
Presentatio n Style	transmit enthusiasm and enthusiasm to listeners The speaker is calm and uses proper intonation, speaks without relying on notes, and interacts The speaker is calm, to speaker is calm, to speak without quite often relies notes. Sometimes eye contact with to speaker is calm, to speak without relying on notes, and interacts		In general the speaker is calm, but with a flat tone and quite often relies on notes. Sometimes eye contact with the listener is ignored.	Based on the notes, no ideas are developed outside the notes, the sound is monotonous	The speaker is anxious and uncomfortable, and reads notes rather than speaking. Listeners are often ignored. There is no eye contact because



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speaker always makes eye contact with the listener.		the speaker is looking more at the whiteboard or
		screen.

Rubric for Review Article

	Assessment Aspect	Arti	cle 1	Artic	Article 2		cle 3
No	Score	High 6-10	Low 1-5	High 6-10	Low 1-5	High 6-10	Low 1-5
1.	Articles come from the indexed journals in the last 3 years.						
2.	Articles related to the theme of evolution						
3.	The number of articles at least discusses evolution						
4.	Accuracy in summarizing the important parts of the abstract of the article						
5.	Accuracy of summarizing important thought concepts in the article						
6.	Accuracy of summarizing the methodology used in the article						
7.	The accuracy of summarizing the research results in the article						
8.	The accuracy of summarizing the discussion of research results in the article						
9.	The accuracy of summarizing the conclusions of the research results in the article						
10.	The accuracy of commenting on selected journal articles						
Total	score for each article summary						
	Average score obtained						

ASSESSMENT

Rubric



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	 A. Identify various misconception about evolution B. How to teach evolution to students? C. How is evolution viewed from the aspect of theory, fact, and path 	some learning source and media/tools C. Explaining about theory and fact about evolution
CLO 2 Through Team Based Project, students are able to communicate verbally and argumentatively sharing forms of organic evolution based on sangiran field studies and other sources	Team Project: Make the design of evolutionary learning instruments with evolutionary material in different groups of organisms (CLO2)	Look for a variety of valid and actual learning resources about plant evolution, animal evolution, and microorganism evolution then present it in the form of web tutorials, pocketbooks, or other learning products.
CLO 3 Through discussion, students are able Able to communicate search results and analysis of genetic and molecular data information in evolutionary studies	Search articles / other sources of various genetic and molecular data and then analyze the various data to obtain a phylogenetic grouping. (CLO3)	Present molecular data from various organisms and apply analytical-related equipment to create phylogenic trees



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CLO 4 Through class presentations, students are able to communicate the concept of gene interaction of living things and the environment related to evolution	What are the benefits of genetic, evolutionary and environmental relationships? (CLO4)	The answer must contain Presents benefits to organisms and the environment both directly and indirectly from various aspects