UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND SCIENCE
DEPARTMENT OF BIOLOGY EDUCATION
Colombo 1 Street Yogyakarta 55281
Phone: (0274)565411 Ext. 217, (0274)565411(Administration Office),fax (0274)548203
Website:fmipa.uny.ac.id, E-mail :humas_fmipa@uny.ac.id

Module name:	Laboratory Work in Evolution
Module level, if applicable:	Undergraduate
Code:	BIO6123
Sub-heading,if applicable:	-
Classes,if applicable:	-
Semester:	6th
Module coordinator:	Rio Christy Handziko S.Pd.Si., M.Pd
Lecturer(s):	Suratsih. M.Si., dr. Tutiek Rahayu. M.Sc., Rio Christy Handziko S.Pd.Si., M.Pd
Language:	Bahasa Indonesia
Classification within the curriculum:	Compulsory Course
Teaching format / class hours per week during the semester:	100 minutes lectures, 120 minutes structured activities, and 120 minutes individual studyper week
Work load:	Total workload is 91 hours per semester which consists of 100 minuteslectures, 120 minutes structured activities, and 120 minutes individual study per weekfor 16 weeks.
Credit points:	1 SKS (2 ECTS)
Prerequisites course(s):	
Perogram Learning Outcomes:	PL4. Comprehensively mastering Biology (core biology) to solve problems in the field of Biology (problem-solving) and to underlie the concepts of related sciences PL5. Mastering the techniques and methodologies in Biology as well as familiar with the equipment used in Biology laboratories in order to get the knowledge of Biology (how we know what we know) PL6. Being adaptive, creative, innovative in applying the concepts of Biology and other related fields

<table>
<tr><td></td><td>PL7. Being skillful in applying the techniques used in laboratories and daily life
PL9. Being able to work and create jobs/being an entrepreneur in the field of Biology
PL10. Having managerial ability to supervise and evaluate workers and optimizing the networks in order to develop professionalism
PL11. Possessing scientific skills to support the ability to speak in local, national, and international forums</td></tr>
<tr><td>Course Outcomes</td><td>After taking this course, the students have ability to:
CO1. Describe the mechanism of evolution occurring in living things.
CO2. Describe the process of forming the universe, primordial earth and sea water and the division of the earth's age.
CO3. Describe the patterns of evolution of Humans and Primates and their estimated Paleoecosystems.
CO4. Describe the evolutionary patterns of Reptiles and Amphibians and their estimated Paleoecosystems.
CO5. Describe the evolution patterns of Aves and Pisces and their estimated Paleoecosystem.
CO6. Describe invertebrate evolutionary patterns and estimates of the Paleoecosystem.
CO7. Analyze the phylogeny of Homo erectus and its migration and dispersion.
CO8. Analyze rocks based on type, age and layers.
CO9. Analyze evolutionary patterns in primates and humans.
CO10. Analyze Sangiran soil layers / formations, dome formation processes and estimated paleoecosystems.
CO11. Describe the fossilization process and measurement of fossil age.</td></tr>
<tr><td>Content:</td><td>This course contains a study of the evolutionary processes in living things and their environment. It includes the initial study of the universe, the evolution of the earth and the environment, especially about sea water, the patterns of evolution of humans and primates, the patterns of evolution of mammals, the patterns of evolution of reptiles and amphibians, the patterns of evolution of Aves and the patterns of evolution of invertebrates. Study of the fossilization process and how to measure fossil age, study of Sangiran and its ancient formations, the study of Homo erectus migration and dispersal in the world. Students also study the evidence of evolution in the museum. Students observe evidence of evolution in the field through direct observation.</td></tr>
<tr><td>Study/examachievements:</td><td>The final mark will be weight as follow:
<table>
<tr><th>No</th><th>CO</th><th>Assessment Object</th><th>Assessment Technique</th><th>Weight</th></tr>
<tr><td>1</td><td>CO1 to CO11</td><td>Observed attitudes , knolwedge, and skills</td><td>Survey, test, rubrics and manuals</td><td>100%</td></tr>
<tr><td colspan="3"></td><td>Total</td><td>100%</td></tr>
</table></td></tr>
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Forms of media:	Real objects, model, multimedia
Reference:	A. Darwin, Charles. 1859. *The Origin of Species by Means of Natural Selections.* Terjemahan: Ira Tri Onggo, 2015. Teori Evolusi Manusia. Indoliterasi. Yogyakarta. B. Rose, Michael R., Mueller, Laurence D. 2006. *Evolution and Ecology of the organism*. Pearson Prentice Hall, USA. C. Muehlenbein, Michael P. 2015. *Basic in Human Evolution*. Elsevier Academic Press. USA. D. Lewin, Roger., Foley, Robert. 2004. *Second Edition, Principles of Human Evolution*. Blackwell publishing. USA E. Colbert, Edwin H. 1980. Evolution of the Vertebrates, A History of the Backboned Animals Through Time. A Wiley-Interscience Publication. USA. F. Nugraha, Suwita., Wulandari. Bimas, Iwan S. 2014. *Lapisan Tanah dan Lingkungan purba Sangiran*. Kemendikbud, Balai Pelestarian Situs Manusia Purba Sangiran. Indonesia. G. Widianto, Harry. 2011. Jejak Langkah Setelah Sangiran. Kemendikbud, Balai Pelestarian Situs Manusia Purba Sangiran. Indonesia. H. Wanninger, Andreas. 2015. *Evolutionary Developmental Biology of Invertebrates*. Springer. USA.

PLO and CO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11
CO1				✓							✓
CO2				✓							✓
CO3				✓							✓
CO4				✓							✓
CO5				✓							✓
CO6				✓							✓
CO7				✓						✓	
CO8					✓	✓	✓			✓	
CO9						✓				✓	
CO10					✓	✓			✓	✓	
CO11					✓	✓	✓				✓