SEMESTER LEARNING ACTIVITY PLANS
(SLAP)
SEMESTER EVEN 2022/2023

Physical Geology

MFF5910 / 2 Credits

Lecturer Coordinator:

Prof. Dr. Ir. Subagyo Pramumijoyo, DEA.

UNIVERSITAS GADJAH MADA
FACULTY OF MATHEMATICS AND NATURAL SCIENCE
2022

Universitas Gadjah Mada
Faculty of Mathematics and Natural Science
Physics Department / Study Program Master Physics
Semester Even 2022/2023

SEMESTER LEARNING ACTIVITY PLANS (SLAP)

Code	Course Name	Credits (credits)	Semester	Status	Prerequisite
MFF5910	*Physical Geology*	*2*	*Even*	*Elective*	*None*

Short Description

Physical Geology course is Elective course 2 credits (Theory) in the 2022 Curriculum Master Physics Study Program, Faculty of Mathematics and Natural Science UGM.

The syllabus of this course is as follows:
Physical Geology Course studies the concepts of geology, the physical properties of the planet earth and the constituent materials of the earth's body, and the processes that occur in the earth's crust with an emphasis on tectonics, plate tectonic theory, the formation of the earth's crust, petrology and stratigraphy, geomorphology, geological structure, geological hazards, and the presentation of geological data in geological maps.

The courses are held in class for 14 weeks, each week's session last for 2 x 50 minutes. Four weeks of course period is used for Midterm Exam and Final Exam, each held for two weeks as scheduled.

Student evaluation for course assessments is performed summative and formative. The summative evaluation is implemented as written exams, both Midterm and Final Exam, which take a maximum of 120 minutes. The formative evaluation is implemented as individual assignments for each student in the form of completing an assignment individually. Monitoring is carried out by observing student activities during the course, such as attendance, Q&A and discussion about the material presented, and student performance in completing individual assignments.

Program Learning Outcomes (PLO) Imposed on the Course

PLO 1	Have a commendable attitude and ethics as a scientist.
PLO 2	Having the professional ability of a scientist.
PLO 3	Mastering further knowledge of classical and modern physics theory, and its relationship with other disciplines, and has mastered an advanced field of physics specialization that allows him to keep up with the latest international research developments.
PLO 4	Mastering various mathematical disciplines related to an advanced field of physics, and able to develop physical models using various mathematical and computational tools with an inter or multidisciplinary approach to solving problems related to an advanced field of physics.
PLO 6	Able to apply knowledge to analyze, synthesize, formulate problems and solve problems comprehensively in one of advanced field of physics, through experimental or theoretical research, then be able to classify and draw conclusions about their findings for the development of science and technology.

Upon completion of this course, students should be able to:

Course Outcomes (CO)	***CO1***	Understanding the definitions of geology and physical geology, the development of theory of continental drift, sea floor spreading, plate tectonics, the physical properties of Earth (gravitational force, magnetism of earth, Earth's revolutions, theory of isostasy).		
	CO2	Understand rock-forming minerals and radioactive properties of minerals, magma, types of igneous rocks, and pyroclastic rocks products of volcanic eruptions.		
	CO3	Understanding clastic and non-clastic sedimentary rocks, metamorphic rocks, weathering of rocks (weathering), and stratigraphy.		
	CO4	Understand the geology cycles (hydrogeological, rock, carbon cycle), the geology of structures and landscapes, tectonic extensions, compression, and transformation.		
	CO5	Understand earthquakes and plate tectonics, geology, and natural resource exploration.		
	CO6			
	CO7			
	CO8			
The Correlation of CO to Learning Materials and Methods, and Time Allocation		**Learning Materials**	**Learning Methods**	**Time Allocation**
	CO1	Introduction to the definitions of geology and physical geology.	Lecture, discussion	2 x 50 minutes
	CO1	The development of the theory of "continental drift - sea floor spreading - plate tectonics".	Lecture, discussion	2 x 50 minutes
	CO1	Physical properties of planet earth (gravity, earth's magnetism, earth's revolution, isostasi theory).	Lecture, discussion	2 x 50 minutes
	CO2	An introduction to rock-forming minerals and the radioactive properties of minerals.	Lecture, discussion	2 x 50 minutes
	CO2	Magma and igneous rock types.	Lecture, discussion	2 x 50 minutes
	CO2	Pyroclastic rock products of volcanic eruptions.	Lecture, discussion	2 x 50 minutes
	CO2	Clastic and non-clastic sedimentary rocks.	Lecture, discussion	2 x 50 minutes
	CO3	metamorphic rock	Lecture, discussion	2 x 50 minutes
	CO3	Rock weathering and stratigraphy.	Lecture, discussion	2 x 50 minutes
	CO3	Cycles in geology (hydrogeological cycle, rock cycle, carbon cycle).	Lecture, discussion	2 x 50 minutes
	CO4	Geology of structures and landscapes.	Lecture, discussion	2 x 50 minutes
	CO4	Tectonic extension, compression and transform.	Lecture, discussion	2 x 50 minutes
	CO4	Earthquakes and plate tectonics.	Lecture, discussion	2 x 50 minutes
	CO4	Geology and natural resource exploration.	Lecture, discussion	2 x 50 minutes

<table>
<tr><td></td><td colspan="4">Final Exam/ Project Task Results/ Case Analysis Results</td></tr>
<tr><td>Learning Methods</td><td colspan="4">Lecture, discussion</td></tr>
<tr><td>Student Learning Experience</td><td colspan="4">Learn to analyze and review: Introduction to the definitions of geology and physical geology., The development of the theory of "continental drift - sea floor spreading - plate tectonics"., Physical properties of planet earth (gravity, earth's magnetism, earth's revolution, isostasi theory)., An introduction to rock-forming minerals and the radioactive properties of minerals., Magma and igneous rock types., Pyroclastic rock products of volcanic eruptions., Clastic and non-clastic sedimentary rocks., metamorphic rock, Rock weathering and stratigraphy., Cycles in geology (hydrogeological cycle, rock cycle, carbon cycle)., Geology of structures and landscapes., Tectonic extension, compression and transform., Earthquakes and plate tectonics., Geology and natural resource exploration..</td></tr>
<tr><td>Access to Learning Media/ LMS and Offline and Online Percentage</td><td colspan="4">Sync (google meet), Asynchronous (google classroom, video)</td></tr>
<tr><td>Assessment Methods and Synchronization with CO</td><td colspan="4">
<table>
<tr><th>Assessment Methods</th><th>Assessment Percentage</th><th>Criteria/Indicators</th><th>CO1</th><th>CO2</th><th>CO3</th><th>CO4</th></tr>
<tr><td>Participatory Activity*</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Project Results/ Case Study Results/ PBL Results*</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="7">Cognitive</td></tr>
<tr><td>Assignment</td><td>30%</td><td></td><td>7,5%</td><td>7,5%</td><td>7,5%</td><td>7,5%</td></tr>
<tr><td>Quiz</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Midterm Exam</td><td>35%</td><td></td><td>17,5%</td><td>17,5%</td><td></td><td></td></tr>
<tr><td>Final Exam</td><td>35%</td><td></td><td></td><td></td><td>17,5%</td><td>17,5%</td></tr>
<tr><td colspan="7">*) can also be obtained from the Midterm or Final Exam as the result of participatory activities or project/ case study results. According to IKU 7, the percentage of project results/ case study/ PBL results is at least 50%.</td></tr>
</table>
</td></tr>
<tr><td>References</td><td colspan="4">Main references:
1. Sanders, J.E., 1981, Principle of Physical Geology, John Willey & Sons.
2. Hamblin, W.K., 1982, The Earth’s Dynamic System, Burgess PublishingCo., Minnesota.</td></tr>
<tr><td>Lecturers (Team Teaching)</td><td colspan="4">1. Prof. Dr. Ir. Subagyo Pramumijoyo, DEA.
2.
3.
4.</td></tr>
<tr><td>Authorization</td><td>Date of Drafting</td><td>Lecturer Coordinator</td><td>Head of Curriculum Committee</td><td>Head of Study Program</td></tr>
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		Prof. Dr. Ir. Subagyo Pramumijoyo, DEA.	Dr.Ing. Ari Setiawan	Mirza Satriawan, M.Si., Ph.D