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

Geoscience Field Trip

MFF5939 / 2 Credits

Lecturer Coordinator:

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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 Odd 2022/2023

SEMESTER LEARNING ACTIVITY PLANS (SLAP)

Code	Course Name	Credits (credits)	Semester	Status	Prerequisite
MFF5939	*Geoscience Field Trip*	*2*	*Odd*	*Elective*	*None*

Short Description

Geoscience Field Trip course is Elective course 2 credits (Practicum) in the 2022 Curriculum Master Physics Study Program, Faculty of Mathematics and Natural Science UGM.

The syllabus of this course is as follows:
This Geophysical Field Practice raises one case study using actual field data with the same target. Material:
1. Seismic Methods: a. Conducting field refraction seismic measurements, creating a travel time curve from seismic refraction data, modeling seismic refraction data. b. Conducting micro-seismic measurements in the field, calculating HVSR and PGA (Peak Ground Acceleration) mapping.
2. Gravity Method: perform field measurements with gravimeter tools, reduce and correct gravity data, calculate complete Bouguer anomalies, reduce to flat planes, filter gravity data, and interpret data qualitatively and quantitatively (modeling).
3. Magnetic Method: perform geomagnetic field measurements with a magnetometer, reduce and correct magnetic data, calculate magnetic anomalies, filter magnetic data (continuation), and interpret data qualitatively and quantitatively (modeling).
4. Geoelectric Method: measuring resistivity in both sounding and mapping fields, processing pseudo-resistivity data, conducting 1D and 2D modeling of resistivity data.
5. Electromagnetic Method: a. Conducting electromagnetic VLF (Very Low Frequency) field measurements, processing, and interpreting VLF data, both qualitatively and quantitatively. b. Perform CSAMT (Controlled Source Audio Frequency Magnetotelluric) acquisition, processing, and interpretation of CSAMT data, both qualitatively and quantitatively.

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.

Course Outcomes (CO)	**Upon completion of this course, students should be able to:**	
	CO1	Take care of geophysical field survey permits.
	CO2	Understand how to work, maintain, and operate various geophysical equipment in the field.
	CO3	Carry out data acquisition, processing, and interpreting geophysical data (modelling) with gravity methods.
	CO4	Acquire data, process, and interpret geophysical data (modelling) with magnetic methods.
	CO5	Carry out data acquisition, processing, and interpretation of geophysical data (modelling) with geoelectric methods.
	CO6	Carry out data acquisition, processing, and interpretation of geophysical data (modelling) with geo-electromagnetic methods.
	CO7	Acquire, process, and interpret geophysical data (modelling) with seismic methods.
	CO8	Operate various survey support equipment, such as GPS, compass, geological hammer, and reading topographic and geological maps.

The Correlation of CO to Learning Materials and Methods, and Time Allocation		**Learning Materials**	**Learning Methods**	**Time Allocation**
	CO1	Introduction: Explanation of syllabus material, course coverage and evaluation. Explanation of the SCL method, Energy Problems.	Practicum, discussion, presentation	2 x 50 minutes
	CO1	Learn how geophysical data acquisition tools and techniques work.	Practicum, discussion, presentation	2 x 50 minutes
	CO1	Technique of data acquisition, processing and interpretation of gravity method.	Practicum, discussion, presentation	2 x 50 minutes
	CO2	Technique of acquisition, processing and interpretation of magnetic method data.	Practicum, discussion, presentation	2 x 50 minutes
	CO2	Geoelectric method of data acquisition, processing and interpretation.	Practicum, discussion, presentation	2 x 50 minutes
	CO2	Techniques for data acquisition, processing and interpretation of electromagnetic methods.	Practicum, discussion, presentation	2 x 50 minutes
	CO2	Techniques of acquisition, processing and interpretation of seismic method data.	Practicum, discussion, presentation	2 x 50 minutes

	CO3	The technique of using survey support equipment in the field.	Practicum, discussion, presentation	2 x 50 minutes
	CO3	Evaluation of the results of the explanation of the workings and techniques of using geophysical tools.	Practicum, discussion, presentation	2 x 50 minutes
	CO3	Geophysical survey with gravity method.	Practicum, discussion, presentation	2 x 50 minutes
	CO4	Geophysical survey with magnetic method.	Practicum, discussion, presentation	2 x 50 minutes
	CO4	Geophysical survey with geoelectric method.	Practicum, discussion, presentation	2 x 50 minutes
	CO4	Geophysical survey with electromagnetic method.	Practicum, discussion, presentation	2 x 50 minutes
	CO4	Geophysical survey with seismic method.	Practicum, discussion, presentation	2 x 50 minutes
	Final Exam/ Project Task Results/ Case Analysis Results			
Learning Methods	Practicum, discussion, presentation			
Student Learning Experience	Learn to analyze and review: Introduction: Explanation of syllabus material, course coverage and evaluation. Explanation of the SCL method, Energy Problems., Learn how geophysical data acquisition tools and techniques work., Technique of data acquisition, processing and interpretation of gravity method., Technique of acquisition, processing and interpretation of magnetic method data., Geoelectric method of data acquisition, processing and interpretation., Techniques for data acquisition, processing and interpretation of electromagnetic methods., Techniques of acquisition, processing and interpretation of seismic method data., The technique of using survey support equipment in the field., Evaluation of the results of the explanation of the workings and techniques of using geophysical tools., Geophysical survey with gravity method., Geophysical survey with magnetic method., Geophysical survey with geoelectric method., Geophysical survey with electromagnetic method., Geophysical survey with seismic method..				
Access to Learning Media/ LMS and Offline and Online Percentage	Whiteboard, LCD, geophysical measuring tools supporting field surveys			
Assessment Methods and Synchronization with CO				

Assessment Methods	**Assessment Percentage**	**Criteria/Indicators**	**CO1**	**CO2**	**CO3**	**CO4**
Participatory Activity*						
Project Results/ Case Study Results/ PBL Results*						
Cognitive						
Assignment	30%		7,5%	7,5%	7,5%	7,5%
Quiz						
Midterm Exam	35%		17,5%	17,5%		
Final Exam	35%				17,5%	17,5%

	*) 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%.	
References	**Main references:** Geophysical Field Practice Manual S2, published by the Lab. Geophysics UGM.	
Lecturers (*Team Teaching*)	1. Dr. Wahyudi, M.S. 2. Dr.rer.nat. Mochamad Nukman, S.T., M.Sc. 3. 4.	

Authorization	**Date of Drafting**	**Lecturer Coordinator**	**Head of Curriculum Committee**	**Head of Study Program**
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