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

Non-Electromagnetics Survey

MFF5934 / 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 Even 2022/2023

SEMESTER LEARNING ACTIVITY PLANS (SLAP)

Code	Course Name	Credits (credits)	Semester	Status	Prerequisite
MFF5934	*Non-Electromagnetics Survey*	*2*	*Even*	*Elective*	*None*

Short Description

Non-Electromagnetics Survey 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:
Geophysical survey with gravity, seismic (reflective and refracted) methods, radioactivity, thermometry, basic multi-theory methods, types of exploration goals, instrumentation, data collection procedures, their analysis and interpretation, and examples of their application.

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 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 5	Able to plan, manage and carry out experiments and conclude the results, or be able to create and use modeling and simulations based on the basic principles of physics to study and solve a problem in a scientific field of Physics or applied Physics that produces models, methods, or theories tested and innovative.
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	Understand the basic theory of seismic waves applications.		
	CO2	Understand the basic theory of the gravity of the earth.		
	CO3	Understand and carry out seismic methods acquisition, process, and analysis.		
	CO4	Understand and be able to carry out acquisitions, processes, and analyses of gravity methods.		
	CO5			
	CO6			
	CO7			
	CO8			
The Correlation of CO to Learning Materials and Methods, and Time Allocation		**Learning Materials**	**Learning Methods**	**Time Allocation**
	CO1	Basic Seismic Waves 1 and 2 (1 week).	Lecture, discussion	2 x 50 minutes
	CO1	Biased Seismic Survey (3 weeks).	Lecture, discussion	2 x 50 minutes
	CO1	Biased Seismic Survey (3 weeks).	Lecture, discussion	2 x 50 minutes
	CO2	Bias Seismic Survey (Weeks 3)	Lecture, discussion	2 x 50 minutes
	CO2	Surface Wave Seismic Survey (3 weeks).	Lecture, discussion	2 x 50 minutes
	CO2	Surface Wave Seismic Survey (3 weeks).	Lecture, discussion	2 x 50 minutes
	CO2	Surface Wave Seismic Survey (3 weeks).	Lecture, discussion	2 x 50 minutes
	CO3	Basic Seismic Waves 1 and 2 (1 week).	Lecture, discussion	2 x 50 minutes
	CO3	Potential theory review (1 week).	Lecture, discussion	2 x 50 minutes
	CO3	Basic data acquisition (2D and 3D) and introduction to measurement instruments (2 weeks).	Lecture, discussion	2 x 50 minutes
	CO4	Basic data acquisition (2D and 3D) and introduction to measurement instruments (2 weeks).	Lecture, discussion	2 x 50 minutes
	CO4	Steps for correction and reduction of gravity data (2 weeks).	Lecture, discussion	2 x 50 minutes
	CO4	Steps for correction and reduction of gravity data (2 weeks).	Lecture, discussion	2 x 50 minutes
	CO4	Gravity data interpretation step (2 weeks).	Lecture, discussion	2 x 50 minutes

	Final Exam/ Project Task Results/ Case Analysis Results
Learning Methods	Lecture, discussion
Student Learning Experience	Learn to analyze and review: Basic Seismic Waves 1 and 2 (1 week)., Biased Seismic Survey (3 weeks)., Biased Seismic Survey (3 weeks)., Bias Seismic Survey (Weeks 3), Surface Wave Seismic Survey (3 weeks)., Surface Wave Seismic Survey (3 weeks)., Surface Wave Seismic Survey (3 weeks)., Basic Seismic Waves 1 and 2 (1 week)., Potential theory review (1 week)., Basic data acquisition (2D and 3D) and introduction to measurement instruments (2 weeks)., Basic data acquisition (2D and 3D) and introduction to measurement instruments (2 weeks)., Steps for correction and reduction of gravity data (2 weeks)., Steps for correction and reduction of gravity data (2 weeks)., Gravity data interpretation step (2 weeks)..
Access to Learning Media/ LMS and Offline and Online Percentage	Powerpoint, software
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:** 1. Milson, J, 1995, Field Geophysics, Oxford Univ.Press. 2. Hochstein, M.O., 1982, Introduction to Geothermal, Propecting, GeothermInstitut Univ. of Auckland. 3. Parasnis, D.S., 1979, Principles of Applied Geophysics, Chapman and Hall.
Lecturers (*Team Teaching*)	1. Dr.rer.nat. Ade Anggraini, M.T. 2. Dr. Eddy Hartantyo, M.Si. 3. 4.

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

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