

**PROGRAM PLAN AND
SEMESTER LEARNING
ACTIVITIES
(RPKPS)
SCHOOL YEAR
2021/2022**



Physical Geophysics
Geoelectric and Electromagnetic Methods
MFG 2120/ 2 credits

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**GADJAH MADA UNIVERSITY
FACULTY OF MATHEMATICS
AND NATURAL SCIENCES
2021**



Gadjah Mada University
 Faculty of Mathematics and Natural Sciences
 Department of Physics / S1 Geophysics Study
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Document Code:

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SEMESTER LEARNING PROGRAM AND ACTIVITY PLAN (RPKPS)

Course Code	Course Name	Weight (credit)		Semester	Course Status	Prerequisite Courses
MFG 2120	Geoelectric and Electromagnetic methods ethics	T: 2	P: -	Complete	Mandatory	Geophysical Electromagnetics
Course Brief Description	<p>Geoelectrical and Electromagnetic Methods is an advanced course which is the implementation of basic courses in the realm of geophysical exploration. Therefore, students who take this course should have understood the basic concepts of earth physics in the context of utilizing natural resources.</p> <p>The learning objectives of the Geoelectrical and Electromagnetic Methods Course are that students have the ability to: (1) know and understand (<i>knowledge and comprehension</i>) about the basic concepts of electrical and electromagnetic physics as an approach to the study of the basic framework of natural resource exploration analysis based on geoelectrical and electromagnetic methods; (2) apply subsurface maps based on resistivity values starting from data acquisition to processing to determine the existence of natural resources; (3) formulate (<i>synthesis</i>) about local geology and good environmental management.</p>					
Graduate Learning Outcomes (CPL) Charged to MK	CPL3	Operational and comprehensive skills: Graduates are able to apply all geophysical methods (seismic, gravitational, magnetic, electrical, electromagnetic, and thermic methods) for energy exploration (e.g. oil and gas, coal, geothermal), mining materials (eg: iron, copper, gold, silver, tin) as well as groundwater and disaster mitigation				
	CPL4	Application and analysis skills: Graduates are able to carry out and manage a geophysical survey which includes scientific steps in the acquisition, processing and interpretation of data for the exploration of natural resources both for energy (e.g. oil and gas, coal, for energy exploration (e.g. oil and gas, coal, geothermal), mining materials (eg: iron, copper, gold, silver, tin) as well as groundwater and disaster mitigation				
	CPL5	Synthesis and Evaluation Skills: Graduates are able to interpret geophysical data in the form of solving advanced and reverse problems (inverse problems) in an integrated manner that have ambiguous characters, carry out interpretation by making models and / or solving simple forward and reverse problems and are skilled in the use of computers both for the purposes of solving geophysical problems and for communication and internet access				
Course Learning Outcomes (CPMK)	After completing the learning of this course, students are expected to be able to:					
	CPMK1	Students apply the basics in Geoelectrical and Electromagnetic methods [CPL-3][CPL-4][CP-5]				
	CPMK2	Students integrate Geoelectrical and Electromagnetic methods				

		[CPL4,CPL5]														
CPL mapping with CPMK	<table border="1"> <tr> <td></td> <td>CPMK-1</td> <td>CPMK-2</td> </tr> <tr> <td>CPL-3</td> <td></td> <td></td> </tr> <tr> <td>CPL-4</td> <td></td> <td></td> </tr> <tr> <td>CPL-5</td> <td></td> <td></td> </tr> </table>					CPMK-1	CPMK-2	CPL-3			CPL-4			CPL-5		
		CPMK-1	CPMK-2													
	CPL-3															
	CPL-4															
CPL-5																
The Relationship of CPMK with Learning Materials and Forms, as well as Time Allocation		Learning Materials	Forms of Learning	Time Allocation												
	<i>CPMK1</i>	Introduction to geoelectricity;	TCL - SCL mixed	2 hours												
	<i>CPMK1</i>	Archie's law	TCL - SCL mixed	2 hours												
	<i>CPMK1</i>	Natural earth potential	TCL - SCL mixed	2 hours												
	<i>CPMK1</i>	(1) Ways of acquisition of the SP method, (2) How to process SP data	TCL - SCL mixed	2 hours												
	<i>CPMK1</i>	(1) Ways of acquisition of geoelectricity methods, (2) How to process	TCL - SCL mixed	2 hours												
	<i>CPMK1</i>	(1) Induced Polarization (IP)	TCL - SCL mixed	2 hours												
	<i>CPMK1</i>	Case Study 1	TCL - SCL mixed	2 hours												
	UTS/Project Task Results/Case Analysis															
	<i>CPMK1</i>	Introduction to the Electromagnetic method	TCL - SCL mixed	2 hours												
	<i>CPMK1</i>	VLF	TCL - SCL mixed	2 hours												
	<i>CPMK1</i>	MT	TCL - SCL mixed	2 hours												
	<i>CPMK1</i>	GPR	TCL - SCL mixed	2 hours												
	<i>CPMK2</i>	Case study 2	TCL - SCL mixed	2 hours												
	<i>CPMK2</i>	Case study 3	TCL - SCL mixed	2 hours												
	<i>CPMK2</i>	Case study 4	TCL - SCL mixed	2 hours												
	UAS/ Project Task Results/ Case Analysis															
Learning Methods	TCL - SCL mixed															
Student Learning Experience	Students listen to the lecturer's explanation when the lecturer presents, then continues the discussion / question and answer. Students make presentations, lecturers become moderators and direct discussions.															

Access Learning Media / LMS and Offline & Online Percentage	LCD, Geophysical Equipment, google classroom or Simaster (e-learning)				
Assessment Methods and Alignment with CPMK	Assessment Techniques	Assessment Percentage	Criteria/ Indicators	CPMK 1	CPMK2
	Participatory Activities^{*)}	20		√	√
	Project Results/Case Study Results/PBL Results^{*)}	40		√	√
	Cognitive				
	UTS	20		√	
	UAS	20			√
	Total	100			
	^{*)} can also be obtained from UTS or UAS which is the result of participatory activities or <i>project / case study</i> results. In accordance with IKU 7, the percentage of participatory activities and project results/case studies/PBL results is at least 50%.				
Reference List	<ol style="list-style-type: none"> 1. Telford, W. M., 1976, <i>Applied Geophysics</i>, Cambridge University Press. 2. Keller, G.V., Frischknecht, F.C., 1966, <i>Electrical Methods in Geophysical Prospecting</i>, London, Pergamon Press. 3. Nabighian, M. N, 1988, <i>Electromagnetics Method in Applied Geophysics</i>, Investigations in Geophysics Series No. 2, Society of Exploration Geophysicists (SEG). 				
Name of Lecturer (Team Teaching)	<ol style="list-style-type: none"> 1. Dr. Eddy Hartantyo, M.Si. 2. Dr. rer. Nat. Sintia Windhi Niasari, M. Eng. 				
Authorization	Drafting Date	Course Coordinator	Coordinator of Expertise (if any)		Head of Study Program
	<i>Aug 16, 2022</i>	<i>(Signature)</i>			