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

Geophysics

Geothermal Exploration Practicum

MFG 4728/ 1 credits

Mentoring Team:

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UNIVERSITAS GADJAH MADA FACULTY OF MATHEMATICS AND NATURAL SCIENCES
2021

	Gadjah Mada University Faculty of Mathematics and Natural Sciences Department of Physics / S1 Geophysics Study Program Academic Year 2021/2022	**Document Code:** .....

SEMESTER LEARNING PROGRAM AND ACTIVITY PLAN (RPKPS)

Course Code	Course Name	Weight (credit)		Semester	Course Status	Prerequisite Courses
MFG 4728	*Geothermal Exploration Practicum*	*T: 2*	*P:1*	Even	*Choice*	*All Geophysical methods*

Course Brief Description	Geothermal Exploration Practicum is a supporting course for Geothermal Exploration. After attending the Geothermal Exploration Practicum, students are expected to be able to determine the boundaries of the prospect area for geothermal energy sources, their dimensions, and conditions using integrated geophysical methods together with geology and geochemistry.	
Graduate Learning Outcomes (CPL) Charged n in MK	***CPL-1***	**Good Attitude:** Graduates are honest, disciplined, curious, critical, confident, independent, emotionally mature, cooperative, and trustworthy. Uphold norms, values, morals, religion, general ethics and professional ethics, and actively play a role in the global movement of sustainable development and behave professionally.
	CPL-4	**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.
	CPL-5	**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:**	
	CPMK-1	Students have a disciplined nature and are active in the laboratory [CPL-1].
	CPMK-2	Students are able to recognize the location of geothermal prospects from geological maps or satellite images, able to perform geochemical sampling and calculations [CPL-4]
	CPMK-3	Students are able to integrate geophysical methods for geothermal exploration [CPL-5].

CPL Mapping with CPMK

	CPMK-1	CPMK-2	CPMK-3
CPL-1	√		
CPL-4		√	
CPL-5			√

CPMK link with Material and Form of Learning, as well as Time Allocation

	Learning Materials	Forms of Learning	Time Allocation
CPMK1	Introduction	Project based	2 Hour
CPMK1	Identify geothermal prospect locations from geological maps and satellite imagery	Project based	2 Hour
CPMK2	Perform geothermal fluid sampling	Project based	2 Hour
CPMK2	Calculating ternary diagrams	Project based	2 Hour
CPMK2	Calculating geothermometer	Project based	2 Hour
CPMK3	Case Study 1: Gravity data processing in a Geothermal field	Project based	2 Hour
CPMK3	Case Study 2: Magnetic data processing in a Geothermal field	Project based	2 Hour
CPMK3	Case Study 3: Processing magnetotelluric data in Geothermal fields	Project based	2 Hour
CPMK3	Case Study 4: MEQ data processing in a Geothermal field	Project based	2 Hour
CPMK3	*Field Trip*	Project based	6 Hour

Learning Methods

Project based learning

Student Learning Experience

Listening to lecturers/assistants' explanations, observations, practices and discussions

Access to Learning Media an/ LMS and Offline &; Online Percentage

LCD, Simaster (e-learning), geological maps, fluid sampling tools, thermometers, geological compasses, geological hammers, geological loupes, 100% offline

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<tr><td>Assessment Methods and Alignment with CPMK</td><td>
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<tr><th></th><th>CPMK-1</th><th>CPMK-2</th><th>CPMK-3</th></tr>
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<tr><td>CPL-5</td><td></td><td></td><td></td></tr>
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<tr><td>Reference List</td><td>

Ellis, A.J., and Mahon, W.A.J., 1977, Chemistry and Geothermal systems. Academic press Inc.
Rybach, L. and Muffler, L.P.J., 1981, Geothermal Systems; Priciples and case Histories. John Wiley and Sons.
Hochstein, M.P. and Sayogi S., 2010, Indonesia Development of Geothermal Procpecting. Geothermics.
Stober, Ingrid, Bucher, Kurt, 2013, Geothermal Energy From Theoretical Models to Exploration and Development, Springer.

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<tr><td>Name of Lecturer (Team Teaching)</td><td>1. Dr. rer. Nat. Mochamad Nukman
2. Dr. rer. Nat. Sintia Windhi Niasari</td></tr>
<tr><td>Authorization</td><td>
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<tr><th>Drafting Date</th><th>Course Coordinator</th><th>Coordinator of Expertise (if applicable)</th><th>Head of Study Program</th></tr>
<tr><td>Aug 16, 2022</td><td>Dr.rer.nat. Mochamad Nukman</td><td>Dr. rer.nat. Ade Anggraini, M.T.</td><td> 
Dr. Sudarmaji, MSi</td></tr>
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