

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



Geophysical  
Geochemistry  
MKK4707/ 2 credits

Mentoring Team:

**Dr. rer. Nat. Mochamad Nukman, S. T.,**  
**M.Sc. Dr. rer. Nat. Herlan Darmawan, S.Si.,**

**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  | Semester |        | Course Status            | Prerequisite Courses   |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|---|---|---|----------|--------|--------------------------|------------------------|--|-------|-------|--------|--|-------|--|---|---|--|-------|---|---|---|--|--|--|--|--|--|
| MKK4707   | Geochemistry  | T: 2  | P:       | even   | Mandatory                |                        |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
| <b>Course Brief Description</b>   | In this course, students will understand Geochemistry in the main elements of the earth's crust, cold earth, oceanic crust, gas, solids, water geochemistry, isotope geochemistry, oxygen isotope, and trace element applications for the investigation of rock chemical elements.  |   |          |        |                          |                        |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
| <b>Graduate Learning Outcomes (CPL) Charged to MK</b>   | <b>CPL-2</b>  | <b>Mastery of knowledge</b> : Graduates are able to apply basic science (mathematics, physics, chemistry, biology, geology), and geophysics in general and their relationship with other sciences such as geology, geodesy, geochemistry, geography, computing and information technology.  |          |        |                          |                        |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|   | <b>CPL-3</b>  | <b>General skills</b><br><b>Operational and comprehensive skills:</b> 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 |          |        |                          |                        |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|   |   |   |          |        |                          |                        |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
| <b>Course Learning Outcomes (CPMK)</b>  | <b>After completing the learning of this course, students are expected to be able to:</b>   |   |          |        |                          |                        |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|   | <b>CPMK-1</b>   | Students are able to understand the basic principles of geochemistry in the main elements of the earth's crust  |          |        |                          |                        |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|   | <b>CPMK-2</b>   | Students are able to understand solid, water, gas, geochemistry   |          |        |                          |                        |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|   | <b>CPMK-3</b>   | Students are able to understand isotope data analysis of geochemistry, oxygen isotope, and trace elements.  |          |        |                          |                        |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
| <b>CPL mapping with CPMK</b>  | <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>CPMK1</th> <th>CPMK2</th> <th>CPMK 3</th> <th></th> </tr> </thead> <tbody> <tr> <td>CPL-2</td> <td></td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>CPL-3</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> |   |          |        |                          |                        |  | CPMK1 | CPMK2 | CPMK 3 |  | CPL-2 |  | ✓ | ✓ |  | CPL-3 | ✓ | ✓ | ✓ |  |  |  |  |  |  |
|   |   | CPMK1   | CPMK2    | CPMK 3 |                          |                        |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|   | CPL-2   |   | ✓        | ✓      |                          |                        |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|   | CPL-3   | ✓   | ✓        | ✓      |                          |                        |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|   |   |   |          |        |                          |                        |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
| <b>The Relationship of CPMK with Learning Materials and Forms, as well as Time Allocation</b> | <b>CPMK</b>   | <b>Learning Materials</b>   |          |        | <b>Forms of Learning</b> | <b>Time Allocation</b> |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|   | <b>CPMK – 1</b>   | Introduction to Geochemistry  |          |        | Lecture                  | 2 Hours                |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|   | <b>CPMK – 1</b>   | Zoning of the Periodic Table that controls the main constituents of the Earth's crust   |          |        | Lecture + SCL            | 2 Hours                |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|   | <b>CPMK – 2</b>   | Solid Geochemistry  |          |        | Lecture                  | 2 Hours                |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|   | <b>CPMK – 2</b>   | Water Geochemistry  |          |        | Lecture                  | 2 Hours                |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|   | <b>CPMK – 2</b>   | Gas Geochemistry  |          |        | Lecture                  | 2 Hours                |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |
|   | <b>CPMK – 2</b>   | Geochemistry assignment   |          |        | Lecture                  | 2 Hours                |  |       |       |        |  |       |  |   |   |  |       |   |   |   |  |  |  |  |  |  |

|  |  |  |                             |               |               |               |   |  |  |
|--|--|--|-----------------------------|---------------|---------------|---------------|---|--|--|
|  |  |  | Lecture                     | 2 Hours       |               |               |   |  |  |
| <b>UTS/Project Task Results/Case Analysis Results</b>                  |  |  |                             |               |               |               |   |  |  |
| <b>CPMK – 1</b>  | Geochemistry of solid earth  |  | Lecture                     | 2 Hours       |               |               |   |  |  |
| <b>CPMK – 1</b>  | Geochemistry of oceanic crust  |  | Lecture                     | 2 Hours       |               |               |   |  |  |
| <b>CPMK – 3</b>  | Oxygen Isotope   |  | Lecture                     | 2 Hours       |               |               |   |  |  |
| <b>CPMK – 3</b>  | <i>Isotope geochemistry</i>  |  | Lecture                     | 2 Hours       |               |               |   |  |  |
| <b>CPMK – 3</b>  | Trace element I  |  | Lecture                     | 2 Hours       |               |               |   |  |  |
| <b>CPMK – 3</b>  | Trace element II   |  | Lecture                     | 2 Hours       |               |               |   |  |  |
| <b>UAS/ Project Task Results/ Case Analysis</b>                        |  |  |                             |               |               |               |   |  |  |
| <b>Learning Methods</b>  | In this course there are 3 learning methods, namely presentations from lecturers, Student Based Learning and discussions                         |  |                             |               |               |               |   |  |  |
| <b>Student Learning Experience</b>                                     | Students actively discuss, listen and understand lecture materials given by lecturers, looking for literacy when <i>student-based learning</i> . |  |                             |               |               |               |   |  |  |
| <b>Access Learning Media / LMS and Offline &amp; Online Percentage</b> | 100% offline   |  |                             |               |               |               |   |  |  |
| <b>Assessment Methods and Alignment with CPMK</b>                      | <b>Assessment Techniques</b>   | <b>Assessment Percentage</b>                         | <b>Criteria/ Indicators</b> | <b>CPMK-1</b> | <b>CPMK-2</b> | <b>CPMK-3</b> |   |  |  |
|  | <b>Participatory Activities<sup>*)</sup></b>   |  |                             |               |               |               |   |  |  |
|  | <b>Project Results/Case Study Results/PBL Results<sup>*)</sup></b>   |  |                             |               |               |               |   |  |  |
|  | <b>Cognitive</b>   |  |                             |               |               |               |   |  |  |
|  | <b>Assignment</b>  |  |                             |               |               |               |   |  |  |
|  | <b>Quiz</b>  | <b>20</b>  |                             |               | ✓             | ✓             | ✓ |  |  |
|  | <b>UTS</b>   | <b>30</b>  |                             |               |               | ✓             | ✓ |  |  |
|  | <b>UAS</b>   | <b>50</b>  |                             |               |               | ✓             | ✓ |  |  |
|  | <b>Total</b>   | <b>100</b>   |                             |               |               |               |   |  |  |
|  | <b>Reference List</b>  | 1. W. M. White, 1997, Geochemistry, Wiley Blackwell. |                             |               |               |               |   |  |  |

|   |   |   |  |  |
|---|---|---|--|--|
| <b>Name of Lecturer<br/>(Team Teaching)</b> | 1. Dr. rer. Nat. Mochamad Nukman, M Si.<br>2. Dr. rer. Nat. Herlan Darmawan, M.Sc |   |  |  |
| <b>Authorization</b>                        | <b>Drafting Date</b>  | <b>Course Coordinator</b>                               | <b>Coordinator of Expertise (if any)</b> | <b>Head of Study Program</b>   |
|   | 03<br>September<br>2022   | <i>Dr. rer. Nat. Mochamad Nukman, S. Si.,<br/>M.Sc.</i> |  | <br>Dr..<br>Sudarmaji,MSi |