MODULE HANDBOOK

<table>
<tr><th colspan="6">MINERALOGY AND PETROGRAPHY</th></tr>
<tr><td colspan="2">Module/Course Title

8720202108</td><td>Student Workload
2 CU X 16 X 170’= 90,6618</td><td>Credits

2 CU
3.18 ECTS</td><td>Semester

3TH SEMESTER</td><td>Frequency

ONCE YEAR</td><td>Duration

1 SEMESTER</td></tr>
<tr><td>1</td><td colspan="2">Types of courses
LECTURES
PRACTICUM</td><td>Contact hours
(2CU X 1,59

ECTS)

X{(50:170’)X

28,51

Workhours=

26,64</td><td>Independent Study
(2CU X 1,59

ECTS)

X{(60:170’)X

28,51

Workhours=

31,96</td><td>Structured Study
(2CU X 1,59

ECTS)

X{(60:170’)X

28,51

Workhours=

31,96</td><td>Class size

MAX 38 STUDENT</td></tr>
<tr><td>2</td><td colspan="6">Prerequisites for participation (if applicable)
-</td></tr>
<tr><td rowspan="5">3</td><td colspan="6">Program Learning outcomes</td></tr>
<tr><td colspan="6">PLO 2
Able to analyze regional and regional characteristics (regionalization) in the context of resources and disasters based on the principles and approaches of geography to support sustainable development</td></tr>
<tr><td colspan="6">PLO 6
Able to make appropriate decisions in the context of problem solving in geography and geography education, based on the results of information and data analysis</td></tr>
<tr><td colspan="6">PLO 8
Able to formulate, process, analyze data, and present geosphere information both physical and human aspects by using geospatial technology for geography learning and research.</td></tr>
<tr><td colspan="6">PLO 11
Demonstrate a responsible attitude towards work in the field of expertise independently</td></tr>
<tr><td></td><td colspan="6">CLO</td></tr>
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	1. Able and responsible for independently conducting mineralogical analysis (PLO-11) 2. Be able to solve the problem of identification of igneous rocks and pyroclastic rocks based on information and data analysis. (CPMK-6) 3. Able to process, analyze, and present sedimentary rock data using geospatial technology for research. (CPL-8) 4. Be able to analyze the characteristics of metamorphic rocks in an area to support sustainable development. (PLO-2)
4	**Subject aims/Content** 1. Crystal, includes understanding and crystal forms 2. Minerals, including the definition, physical and chemical properties of minerals, formation of minerals and Bowen reactions 3. Rocks, including understanding and rock cycle. 4. Igneous Rocks, including the formation process, mineral composition, structure, texture, rock color and types of igneous rocks 5. Clastic Sedimentary Rocks, including formation processes, structures, textures, rock colors and types of clastic sedimentary rocks 6. Non-clastic Sedimentary Rocks, including the process of formation, structure, texture, and types of non-clastic sedimentary rocks 7. Metamorphic Rocks, including the process of formation, structure, texture, and types of metamorphic rocks 8. Pyroclastic rocks, including the process of formation and place of occurrence, types of pyroclastic rocks.
5	**Teaching methods** *Project Base Learning,*
6	**Assessment methods** *paper test*
7	**This module/course is used in the following study programme/s as well** -
8	**Responsibility for module/course** COMPULSORY/~~ELECTIVE~~*/ 1. Klein, C., , Philpotts, A.,2013, Earth Materials. ***Introduction to Mineralogy and Petrology***, New York,Cambridge University Press. 2. Pearl, R.M., 1960, ***How To Know The Minerals And Rocks***, New York, McGraw-Hill Book Company. 3. Petersen, J.F., Sack, D., Gabler, R.E., 2012, ***Physical Geography*** *10th Edition*, Canada, Brooks/Cole, Cengage Learning 4. Sutedjo, A., Hariyanto, B., 2017**, *Buku Ajar. Ilmu Batuan***, Surabaya, FISH Unesa 5. Sutedjo, A., 2019, ***Modul 3. Dinamika Litosfer dan Pengaruhnya Terhadap Kehidupan Manusia***. ***Kegiatan Belajar 1*** : Litosfer, Surabaya, FISH Unesa.