Diponegoro University
Faculty of Science and Mathematics
Undergraduate Program Of Chemistry

Module designation	**Mineral Chemistry (Min)**
Semester(s) in which the module is taught	4
Person responsible for the module	Drs. Suhartana, M.Si Sriatun, M.Si
Language	Indonesian
Relation to curriculum	~~Compulsory /~~ elective ~~/ specialisation~~
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Face to face : 1 x (2 x 50 min); Structured study: 1 x (2 x 60 min); Self study: 1 x (2 x 60 min)
Credit points	2
Required and recommended prerequisites for joining the module	KU
Module objectives/intended learning outcomes	1. Demonstrate an attitude of being responsible for work in their field of expertise independently. (S9) 2. Mastering theoretical concepts on History and understanding of Mineralogy, Minerals, Rocks, and Topographic Maps (PP1) 3. Able to apply logical, critical, systematic, and innovative thinking in the development or implementation of science and technology that pays attention to and uses humanities values by their field of expertise. (KU1) 4. Able to analyze several alternative solutions in identification, analysis, isolation, transformation, and synthesis of available chemicals and present analysis conclusions for appropriate decision making. (KK3)

Content	1. Introduction: 1. Lecture contract, 2. History and understanding of Mineralogy 3. Rocks and Topographic Maps 2. Explain the relationship between Topographic Maps and Geological Maps, Fold geometry, Igneous intrusion, Includes Silicate Structures, Olivines, Garnets, Aluminosilicates, 3. Describe the character of Minerals, including Crystal appearance, including the laws of crystal, gyre, gyroid, and rotary inversion. Some of the minerals studied include Silicate Structures, Olivines, Garnets, Aluminosilicates, Pyroxenes, and Amphiboles. Micas, serpentine, and chlorite compounds were also studied. • Clay Minerals • Tectosilicates • Carbonates, oxides, & accessory minerals 4. Describe the character of Minerals, including Classification of Hermann Mauguin and Groth. Some of the Minerals discussed are: Silicate Structures, Olivines, Garnets, Aluminosilicates, Pyroxenes and Amphiboles, Micas, serpentine, and chlorite 5. Describe the character of Minerals, including: Crystal form and crystal classification. For some Minerals such as Silicate Structures, Olivines, Garnets, Aluminosilicates, Pyroxenes and Amphiboles, Micas, serpentine, and chlorite.Clay Minerals. Examples: Tectosilicates, Carbonates, oxides, & accessory minerals 6. Explaining Mineral Determination, including Physical Mineralogy Determination: Rock Characteristics, Cleavage, Fractures, Spout, Scratches, Glossy, and Color. Includes: Silicate Structures, Olivines, Garnets, Aluminosilicates, Pyroxenes and Amphiboles, Micas, serpentine, and chlorite. Clay Minerals. 7. Explaining Mineral Determination, including Physical Mineralogy Determination: Hardness, Hardness, Magnetism, and Thermal Character. Describe the character of Minerals, including: Silicate Structures, Olivines, Garnets, Aluminosilicates, Pyroxenes and Amphiboles, Micas, serpentine, and chlorite. Clay Minerals. 8. Explaining the Analysis of Rock Compounding Components. Introduction to rock color analysis of rock components. Mineral Stability includes: Mineral Stability, phase diagrams, Binary phase diagrams, congruent jelling, Binary phase diagrams, incongruent melting, solid solution, and exsolution 9. Explaining the Analysis of Rock Compounding Components and Their Chemical Composition. Both qualitative and quantitative analysis. Qualitative analysis determines the components of rock composition, while qualitative research determines the levels of rock constituent substances and determines their chemical composition.

	10. Explaining Qualitative and Quantitative Analysis with Simple Methods, Volumetric and Gravimetric Methods 11. Explaining Qualitative and Quantitative Analysis with Modern Methods, Colorimetric, and Spectroscopy methods. 12. Explain the separation of small-scale metals (laboratory), such as graded deposition (the formation of hydroxide salts and other salts), metal extraction, and electrolysis. 13. Explain Metallurgical Separation of metals, namely the extraction of metals from rocks with the help of high-temperature and large-scale heating (in a furnace). 14. Group discussion, discussing the Separation of Rocks that have been selected by students, in the way that has been explained in lectures 13 and 14.
Exams and assessment formats	Mid-Semester Exam and Final Exam
Study and examination requirements	Participatory Activities 20% Project Results 30% Task 10% Quiz 10% Mid-semester 15% Final exams 15%
Reading list	1. Bayly, B. 1969, Introduction to Petrology, 1 st ed, Prentice Hall Inc, Englewood Cliffs, New Jersey 2. Districh, RV., dan Skinner, B.J., 1979, Rock and Minerals, John Wiley & Sons Inc, Toronto 3. Ehler, E.g., dan Blatt, H., 1980, Petrology, 1 st ed, WH.Freeman Company, San Francisco 4. Thorpe, R.S., dan Brown, GC., 1985, The Field Description of Igneous Rock, John Wiley & Sons, New York. 5. Boggs,S., 1987, Principles of Sedimentology and Stratigraphy, Merril Publishing Company, A Bell & Howell Company, Ohio, USA. 6. Dunham, R.J., 1962, Classification of Carbonate Rocks According to Depositional Textures, AAPG, Oklahoma, USA. 7. Introduction to mineralogy, Nesse, William D., : Oxford University Press,New York, 2012. 8. Crystallography and Physical Mineralogy, Edward Salisbury Dana, John Wiley and Sons, New York, 1922