# SEMESTER COURSE PLAN

**MINERAL DEPOSITS (P1) COURSES**
**(23H06131202)**

**TEACHING TEAM**

Prof. Dr. Ir. Muh. Altin Massinai, MT., Surv.
196406161989031006

Makhrani, S.Si. M.Si
197202271998022002

STUDI PROGRAM OF GEOPHYSICS - S1
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
HASANUDDIN UNIVERSITY
MAKASSAR
2025

**STUDY PROGRAM OF GEOFISIKA - S1**
**FACULTY OF MATHEMATICS AND NATURAL SCIENCES**
**HASANUDDIN UNIVERSITY**

## Vision

Become a program Reliable studies in the field of geophysics to produce superior graduates and mastering science, technology, arts and culture based on BMI in 2030.

## Vision Strategy

## Misson

Based on the Vision above, the Geophysics Study Program has a mission:

1. Improving the quality of education to produce graduates who are competitive, able to work independently and in groups in implementing and developing BMI science and technology;

2. Carrying out research to produce reliable and competitive scientific work oriented towards the scientific development of solid geophysics, marine geophysics, geoinformatics and hydro-meteorology;

3. Disseminate the results of applied research, action studies and appropriate technology packages in synergistic and accelerated productive activities to improve the quality of life of the community.

## Graduate Profiles

Educators in the Field of Geophysics; meteorologist; geomaths; oceanographer; exploration geophysicist; seismologist ; geophysical entrepreneur.

## PLO charged to courses

CPL-4 (P1) - Mastering theoretical concepts of land, sea and geophysics atmosphere, principles of exploration, and design exploration necessary for identification and mapping natural resources and natural disaster mitigation;

CPL-12 (KK2) - Able to discover new natural resources through a process of exploration, analysis, interpretation of data and information based on environmentally friendly exploration geophysical principles

CPL-13 (KK3) - Able to formulate alternative solutions to solve disaster mitigation problems by taking into account public safety, social and environmental factors

## Course Learning Outcomes (CLO)

CPMK-1: Students are able and skilled to analyze the concepts of mineral formation and distribution and apply them to other related fields (CPL4)

CPMK-2: Students are able to use geophysical principles to communicate with the wider community in conveying mineralization phenomena (CPL12 dan CPL13)

## Sub-CLO

Sub CPMK-1: Know the learning structure, learning methods and evaluation system (CPMK-1)

Sub CPMK-2: Know the theory of mineral formation (CPMK-1)

Sub CPMK-3: Identifying the relationship between the magmatism arc zone & the presence of minerals (CPMK-1)

Sub CPMK-4: Describe alteration zone minerals, the characteristics of alteration minerals due to pneumatolytic processes (CPMK-1)

Sub CPMK-5: Identify various types of mineral deposits and their distribution in Indonesia (CPMK-1)

Sub CPMK-6: Analyzing altered minerals in epithermal, hypothermal and mesothermal zones as well as porphyry types (CPMK-1)

Sub CPMK-7: Describes the process of primary and secondary deposits and how to measure mineral reserves (CPMK-1)

Sub CPMK-8: Describes the process of formation of Au, Cu, Fe, Ni minerals in the volcanism zone (CPMK-2)

Sub CPMK-9: Describes the process of formation and existence of tin, diamond and asphalt deposits (CPMK-2)

Sub CPMK-10: Analyze the physico-chemical properties of minerals (CPMK-2)

Sub CPMK-11: Identify several types of minerals using a polarizing microscope (CPMK-2)

Sub CPMK-12: Identify several types of minerals using AAS (CPMK-2)

Sub CPMK-13: Identify several types of minerals using XRD (CPMK-2)

Sub CPMK-14: Identify several types of minerals using XRF (CPMK-2)

# Learning Analytics

Mineral Deposits (P1)

↑

Identify several types of minerals using XRF (CPMK-2)

↑

Identify several types of minerals using XRD (CPMK-2)

↑

Identify several types of minerals using AAS (CPMK-2)

↑

Identify several types of minerals using a polarizing microscope (CPMK-2)

↑

Analyze the physico-chemical properties of minerals (CPMK-2)

↑

Describes the process of formation and existence of tin, diamond and asphalt deposits (CPMK-2)

↑

Describes the process of formation of Au, Cu, Fe, Ni minerals in the volcanism zone (CPMK-2)

↑

Describes the process of primary and secondary deposits and how to measure mineral reserves (CPMK-1)

↑

Analyzing altered minerals in epithermal, hypothermal and mesothermal zones as well as porphyry types (CPMK-1)

↑

Identify various types of mineral deposits and their distribution in Indonesia (CPMK-1)

↑

Describe alteration zone minerals, the characteristics of alteration minerals due to pneumatolytic processes (CPMK-1)

↑

Identifying the relationship between the magmatism arc zone & the presence of minerals (CPMK-1)

↑

Know the theory of mineral formation (CPMK-1)

↑

Know the learning structure, learning methods and evaluation system (CPMK-1)

# HASANUDDIN UNIVERSITY
## FAKULTY OF MATHEMATICS AND NATURAL SCIENCES
## STUDY PROGRAM OF GEOPHYSICS - S1
# SEMESTER LEARNING PLAN

| Course | Code | Cource Group | Credits | SEMESTER | Compilation Date |
|---|---|---|---|---|---|
| Mineral Deposits (P1) | 23H06131202 | Solid Geophysics | 2 | 5 | 1 Juli 2025 |

| AUTHORITY | SLP Developer Lecturer | Coordinator | Head of Study Program |
|---|---|---|---|
| | Prof. Dr. Ir. Muh. Altin Massinai, MT., Surv. | Prof. Dr. Ir. Muh. Altin Massinai, MT., Surv. | Dr. Muhammad Alimuddin, Eng. |

| | | |
|---|---|---|
| **Learning Outcomes Course** | **SLOs that are imposed on the course** | |
| | **SLO-4:** | Menguasai konsep teoritis Geofisika darat, laut dan atmosfer, prinsip-prinsip eksplorasi, dan perancangan eksplorasi yang diperlukan untuk identifikasi dan pemetaan SDA serta mitigasi bencana alam; |
| | **SLO-12:** | Mampu menemukan sumber Daya alam baru melalui proses eksplorasi, analisis, interpretasi data dan informasi berdasarkan prinsip-prinsip geofisika eksplorasi yang ramah lingkungan |
| | **SLO-13:** | Mampu merumuskan alternatif solusi untuk menyelesaikan masalah mitigasi bencana dengan memperhatikan faktor-faktor keselamatan publik, sosial dan lingkungan |
| | **SLO ⇒ Course Learning Outcomes** | |
| | After completing this course, it is expected: | |
| | **SLO-4** | **CLO-1:** Students are able and skilled to analyze the concepts of mineral formation and distribution and apply them to other related fields |
| | **SLO-12** | **CLO-2:** Students are able to use geophysical principles to communicate with the wider community in conveying mineralization phenomena |
| | **SLO-13** | **CLO-2:** Students are able to use geophysical principles to communicate with the wider community in conveying mineralization phenomena |
| | **CLO ⇒ Sub-CLO** | |
| | **CLO-1** | **Sub-CLO-1:**Know the learning structure, learning methods and evaluation system |
| | | **Sub-CLO-2:**Know the theory of mineral formation |
| | | **Sub-CLO-3:**Identifying the relationship between the magmatism arc zone & the presence of minerals |
| | | **Sub-CLO-4:**Describe alteration zone minerals, the characteristics of alteration minerals due to pneumatolytic processes |
| | | **Sub-CLO-5:**Identify various types of mineral deposits and their distribution in Indonesia |
| | | **Sub-CLO-6:**Analyzing altered minerals in epithermal, hypothermal and mesothermal zones as well as porphyry types |
| | | **Sub-CLO-7:**Describes the process of primary and secondary deposits and how to measure mineral reserves |

| | | |
|---|---|---|
| | **CLO-2** | **Sub-CLO-8:**Describes the process of formation of Au, Cu, Fe, Ni minerals in the volcanism zone |
| | | **Sub-CLO-9:**Describes the process of formation and existence of tin, diamond and asphalt deposits |
| | | **Sub-CLO-10:**Analyze the physico-chemical properties of minerals |
| | | **Sub-CLO-11:**Identify several types of minerals using a polarizing microscope |
| | | **Sub-CLO-12:**Identify several types of minerals using AAS |
| | | **Sub-CLO-13:**Identify several types of minerals using XRD |
| | | **Sub-CLO-14:**Identify several types of minerals using XRF |

**Correlation between SLOs/CLOs to Sub-CLOs**

| SLOs that are charged on the Course | CPMK | SUB CPMK | Form of Assessment* | | | | Weight | Value | Student Score |
|---|---|---|---|---|---|---|---|---|---|
| | | | Formative | Sumative | | | | | |
| | | | | Project/Case Study | Task | Summative Test | | | |
| SLO-4 | CLO-1 | SUB-CLO-1 | Student understanding of concepts/terms related to mineral deposits | 4 | 0 | 0 | 4 | | |
| SLO-4 | CLO-1 | SUB-CLO-2 | Quality of group assignments (papers) | 4 | 0 | 0 | 4 | | |
| SLO-4 | CLO-1 | SUB-CLO-3 | Accuracy and Sharpness of analysis | 0 | 4 | 0 | 4 | | |
| SLO-4 | CLO-1 | SUB-CLO-4 | Active in discussions | 5 | 0 | 0 | 5 | | |
| SLO-4 | CLO-1 | SUB-CLO-5 | Quality of group assignments (papers and power points | 0 | 5 | 0 | 5 | | |
| SLO-4 | CLO-1 | SUB-CLO-6 | Quality of group assignments (papers and power points) | 0 | 5 | 0 | 5 | | |
| SLO-4 | CLO-1 | SUB-CLO-7 | ▪ Quality of group assignments (papers and power points) | 0 | 5 | 0 | 5 | | |
| SLO-13 | CLO-2 | SUB-CLO-8 | - and ▪ Quality of group assignments (papers) | 4 | 0 | 10 | 14 | | |
| SLO-13 | CLO-2 | SUB-CLO-9 | ▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers) ▪ Activeness in discussions ▪ Quality of brainstorming/ability to express opinions | 4 | 0 | 0 | 4 | | |

| SLOs that are charged on the Course | CPMK | SUB CPMK | Form of Assessment* | | | | Weight | Value | Student Score |
|---|---|---|---|---|---|---|---|---|---|
| | | | Formative | Sumative | | | | | |
| | | | | Project/Case Study | Task | Summative Test | | | |
| SLO-13 | CLO-2 | SUB-CLO-10 | ▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers) ▪ Quality of percentages ▪ Activeness in discussions ▪ Quality of giving suggestions/ability to express opinions | 4 | 0 | 0 | 4 | | |
| SLO-13 | CLO-2 | SUB-CLO-11 | ▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers and power points) ▪ Quality of percentages ▪ Activeness in discussions ▪ Quality of giving suggestions/ability to express opinions | 9 | 0 | 0 | 9 | | |
| SLO-13 | CLO-2 | SUB-CLO-12 | Student understanding of concepts/terms related to mineral deposits | 9 | 0 | 0 | 9 | | |
| SLO-13 | CLO-2 | SUB-CLO-13 | ▪ Quality of group assignments (papers) ▪ Activeness in discussions ▪ Quality of giving suggestions/ability to express opinions | 9 | 0 | 0 | 9 | | |
| SLO-13 | CLO-2 | SUB-CLO-14 | ▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers) ▪ Activeness in discussions ▪ Quality of brainstorming/ability to express opinions and ▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers and power points) ▪ Quality of percentages ▪ Activeness in discussions ▪ Quality of brainstorming/ability to express opinions | 9 | 0 | 10 | 19 | | |
| | | | | 61 | 19 | 20 | 100 | | |

| | |
|---|---|
| **Course Description** | In this lecture, the meaning and concept of the theory of mineral formation, arc magmatism & presence of minerals, Genesis of altered zone minerals, characteristics of altered minerals due to pneumatolytic processes, Various types of mineral deposits and their distribution in Indonesia, Types of altered minerals in epithermal, hypothermal and mesothermal zones as well as in porphyry types, Primary deposits and secondary deposits, Process of formation of Au, Cu, Fe, Ni minerals etc. in volcanism zones, Process of formation and existence of tin, diamond and asphalt deposits, Physico-chemical properties of minerals, Practicum of polarization microscope, AAS, XRD and XRF (fieldtrip held to study mineral analysis and practical sampling in the field). |
| **Learning Materials/Subjects** | 1. Theory of mineral formation<br>2. Zone of arc magmatism & presence of minerals<br>3. Genesis of alteration zone minerals, characteristics of altered minerals resulting from pneumatolytic processes<br>4. Various types of mineral deposits and their distribution in Indonesia<br>5. Kinds of altered minerals in the epithermal, hypothermal and mesothermal zones as well as in the porphyry type<br>6. Primary deposits and secondary deposits<br>7. The process of formation of Au, Cu, Fe, Ni, etc. minerals in the volcanism zone<br>8. The process of formation and existence of tin, diamond and asphalt deposits<br>9. Physico-chemical properties of minerals<br>10. Determination of several types of minerals using several tools |
| | **Main References** |

| | |
|---|---|
| **Reference** | 1. Alan M. Bateman, Economic Mineral Deposits, New York, John Wiley & Sons,Inc,914p<br>2. Kula C. Misra, Understanding Mineral Deposits, Kluwer Academic Publishers, 758p<br>3. Laurence Robb, Introduction to Re-forming processes, Blackwell Publishing, 373p<br>4. Yustinus Suyatno Yuwono, Petrology and Magmatism in South Sulawesi and Java and their tectonic implications. FITB Petrology and Volcanology Lab, 298p |
| | **Additional References** |
| | 1. Darman, Herman and Hasan Sidi. 2000. An outline of The Geology of Indonesia. Jakarta: Indonesian Association of Geologists. 192 p.<br>2. Hamilton, Warren. 1979. Tectonics of the Indonesian Region. Washington: Geological Survey Professional Paper 1078. 345 p.<br>3. Massinai, Muhammad Altin. 2015. Tectonic Geomorphology. Yogyakarta. Science Publishing Library. |
| **Teaching Team** | Prof. Dr. Ir. Muh. Altin Massinai, MT., Surv., Makhrani, S.Si. M.Si |
| **Course requirement** | |

| Week | Sub CPMK (End-of-stage learning ability) | Penilaian (*Assesment*) | | Learning Forms and Methods [time estimate] | | Content | Weight of Assessment (%) |
|---|---|---|---|---|---|---|---|
| | | Indicator | Techniques & Criteria | Offline | Online | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | Know the learning structure, learning methods and evaluation system (CPMK-1) | **Formative:**<br>Accuracy of application of concepts to answers<br>**Sumative:**<br>- | **Formative Criteria:**<br>Student understanding of concepts/terms related to mineral deposits<br>**Sumative Criteria:**<br>Project/Case Study (4)<br>**Assessment Technique:**<br>Non Test | **Studying:**<br>Other methods<br>TM [1x3x50`] | | Introduction | 4 |
| 2 | Know the theory of mineral formation (CPMK-1) | **Formative:**<br>Accuracy of application of mineral formation<br>**Sumative:**<br>- | **Formative Criteria:**<br>Quality of group assignments (papers)<br>**Sumative Criteria:**<br>Project/Case Study (4)<br>**Assessment Technique:**<br>Non Test | **Studying:**<br>Other methods<br>TM [1x3x50`] | | mineral | 4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | Identifying the relationship between the magmatism arc zone & the presence of minerals (CPMK-1) | **Formative:**<br>Precision in linking mineral presence zones<br><br>**Sumative:**<br>- | **Formative Criteria:**<br>Accuracy and Sharpness of analysis<br><br>**Sumative Criteria:**<br>Task (4)<br>**Assessment Technique:**<br>Non Test | **Studying:**<br>Group discussion (Small Group Discussion)<br><br>TM [1x3x50`] | | Zone of arc magmatism & presence of minerals | 4 |
| 4 | Describe alteration zone minerals, the characteristics of alteration minerals due to pneumatolytic processes (CPMK-1) | **Formative:**<br>Explanation, activeness, understanding and accuracy in determining alteration minerals<br><br>**Sumative:**<br>- | **Formative Criteria:**<br>Active in discussions<br><br>**Sumative Criteria:**<br>Project/Case Study (5)<br>**Assessment Technique:**<br>Non Test | **Studying:**<br>Group discussion (Small Group Discussion)<br><br>TM [1x3x50`] | | Genesis of alteration zone minerals, characteristics of altered minerals due to pneumatolytic processes | 5 |
| 5 | Identify various types of mineral deposits and their distribution in Indonesia (CPMK-1) | **Formative:**<br>Explanation, activeness, understanding and accuracy in determining sediment types in Indonesia<br><br>**Sumative:**<br>- | **Formative Criteria:**<br>Quality of group assignments (papers and power points<br><br>**Sumative Criteria:**<br>Task (5)<br>**Assessment Technique:**<br>Non Test | **Studying:**<br>Group discussion (Small Group Discussion)<br><br>TM [1x3x50`] | | Various types of mineral deposits and their distribution in Indonesia | 5 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 6 | Analyzing altered minerals in epithermal, hypothermal and mesothermal zones as well as porphyry types (CPMK-1) | **Formative:**<br>Explanation, activeness, understanding and accuracy in determining mineral types in these zones<br>**Sumative:**<br>- | **Formative Criteria:**<br>Quality of group assignments (papers and power points)<br>**Sumative Criteria:**<br>Task (5)<br>**Assessment Technique:**<br>Non Test | **Studying:**<br>Group discussion (Small Group Discussion)<br>TM [1x3x50`] | | Kinds of altered minerals in the epithermal, hypothermal and mesothermal zones and in the porphyry type | 5 |
| 7 | Describes the process of primary and secondary deposits and how to measure mineral reserves (CPMK-1) | **Formative:**<br>Explanation, activeness, understanding and accuracy in determining mineral types in primary and secondary deposits and calculating mineral reserves<br>**Sumative:**<br>- | **Formative Criteria:**<br>' Quality of group assignments (papers and power points)<br>**Sumative Criteria:**<br>Task (5)<br>**Assessment Technique:**<br>Non Test | **Studying:**<br>Group discussion (Small Group Discussion)<br>TM [1x3x50`] | | Primary deposits and secondary deposits | 5 |
| 8 | Describes the process of formation of Au, Cu, Fe, Ni minerals in the volcanism zone (CPMK-2) | **Formative:**<br>-<br>**Sumative:**<br>- | **Formative Criteria:**<br>None<br>**Sumative Criteria:**<br>Summative Test (10)<br>**Assessment Technique:**<br>Test and Non-Test | | | Summative Test | 10 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | Describes the process of formation of Au, Cu, Fe, Ni minerals in the volcanism zone (CPMK-2) | **Formative:**<br>Accuracy in determining mineral formation zones2<br><br>**Sumative:**<br>- | **Formative Criteria:**<br>▪ Quality of group assignments (papers)<br><br>**Sumative Criteria:**<br>Project/Case Study (4)<br>**Assessment Technique:**<br>Non Test | **Studying:**<br>Group discussion (Small Group Discussion)<br><br>TM [1x3x50`] | | Gagal diterjemahkan | 4 |
| 10 | Describes the process of formation and existence of tin, diamond and asphalt deposits (CPMK-2) | **Formative:**<br>Gagal diterjemahkan<br><br>**Sumative:**<br>- | **Formative Criteria:**<br>▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers) ▪ Activeness in discussions ▪ Quality of brainstorming/ability to express opinions<br><br>**Sumative Criteria:**<br>Project/Case Study (4)<br>**Assessment Technique:**<br>Non Test | **Studying:**<br>Group discussion (Small Group Discussion)<br><br>TM [1x3x50`] | | The process of formation and existence of tin, diamond and asphalt deposits | 4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 11 | Analyze the physico-chemical properties of minerals (CPMK-2) | **Formative:**<br>Gagal diterjemahkan<br><br>**Sumative:**<br>- | **Formative Criteria:**<br>▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers) ▪ Quality of percentages ▪ Activeness in discussions ▪ Quality of giving suggestions/ability to express opinions<br><br>**Sumative Criteria:**<br>Project/Case Study (4)<br>**Assessment Technique:**<br>Non Test | **Studying:**<br>Group discussion (Small Group Discussion)<br><br>TM [1x3x50`] | | Physico-chemical properties of minerals | 4 |
| 12 | Identify several types of minerals using a polarizing microscope (CPMK-2) | **Formative:**<br>Mastery of tools, accuracy of mineral identification<br><br>**Sumative:**<br>- | **Formative Criteria:**<br>▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers and power points) ▪ Quality of percentages ▪ Activeness in discussions ▪ Quality of giving suggestions/ability to express opinions<br><br>**Sumative Criteria:**<br>Project/Case Study (9)<br>**Assessment Technique:**<br>Non Test | **Practicum, Studio Practice, Workshop Practice, Field Practice:**<br>Group discussion (Small Group Discussion)<br><br>TM [1x3x50`] | | Determination of several types of minerals using a polarizing microscope | 9 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 13 | Identify several types of minerals using AAS (CPMK-2) | **Formative:**<br><br>Mastery of tools, accuracy of mineral identification<br><br>**Sumative:**<br>- | **Formative Criteria:**<br><br>Student understanding of concepts/terms related to mineral deposits<br><br>**Sumative Criteria:**<br><br>Project/Case Study (9)<br><br>**Assessment Technique:**<br><br>Non Test | **Practicum, Studio Practice, Workshop Practice, Field Practice:**<br><br>Group discussion (Small Group Discussion)<br><br>TM [1x3x50`] | | Determination of several types of minerals using AAS | 9 |
| 14 | Identify several types of minerals using XRD (CPMK-2) | **Formative:**<br><br>Mastery of tools, accuracy of mineral identification<br><br>**Sumative:**<br>- | **Formative Criteria:**<br><br>▪ Quality of group assignments (papers) ▪ Activeness in discussions ▪ Quality of giving suggestions/ability to express opinions<br><br>**Sumative Criteria:**<br><br>Project/Case Study (9)<br><br>**Assessment Technique:**<br><br>Non Test | **Practicum, Studio Practice, Workshop Practice, Field Practice:**<br><br>Group discussion (Small Group Discussion)<br><br>TM [1x3x50`] | | Determination of several types of minerals using XRD | 9 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15 | Identify several types of minerals using XRF (CPMK-2) | **Formative:**<br>Mastery of tools, accuracy of mineral identification<br>**Sumative:**<br>- | **Formative Criteria:**<br>▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers) ▪ Activeness in discussions ▪ Quality of brainstorming/ability to express opinions<br>**Sumative Criteria:**<br>Project/Case Study (9)<br>**Assessment Technique:**<br>Non Test | **Practicum, Studio Practice, Workshop Practice, Field Practice:**<br>Group discussion (Small Group Discussion)<br>TM [1x3x50`] | | Determination of several types of minerals using XRF | 9 |
| 16 | Identify several types of minerals using XRF (CPMK-2) | **Formative:**<br>-<br>**Sumative:**<br>- | **Formative Criteria:**<br>▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers and power points) ▪ Quality of percentages ▪ Activeness in discussions ▪ Quality of giving suggestions/ability to express opinions<br>**Sumative Criteria:**<br>Summative Test (10)<br>**Assessment Technique:**<br>Test and Non-Test | **Other Forms:**<br>Case Study (Case Study)<br>TM [1x3x50`] | | Summative test | 10 |
| | | | | | | | 100 |

**Matrix of SLO, CLO, and Assessment Method**

| SLO / CLO | CLO-1 | CLO-2 |
|---|---|---|
| CPL-4 (P1) | Project/Case Study (Weight 4%)<br>Project/Case Study (Weight 4%)<br>Task (Weight 4%)<br>Project/Case Study (Weight 5%)<br>Task (Weight 5%)<br>Task (Weight 5%)<br>Task (Weight 5%) | |
| CPL-12 (KK2) | | Summative Test (Weight 10%)<br>Project/Case Study (Weight 4%)<br>Project/Case Study (Weight 4%)<br>Project/Case Study (Weight 4%)<br>Project/Case Study (Weight 9%)<br>Project/Case Study (Weight 9%)<br>Project/Case Study (Weight 9%)<br>Project/Case Study (Weight 9%)<br>Summative Test (Weight 10%) |

| SLO / CLO | CLO-1 | CLO-2 |
|---|---|---|
| CPL-13 (KK3) | | Summative Test (Weight 10%)<br>Project/Case Study (Weight 4%)<br>Project/Case Study (Weight 4%)<br>Project/Case Study (Weight 4%)<br>Project/Case Study (Weight 9%)<br>Project/Case Study (Weight 9%)<br>Project/Case Study (Weight 9%)<br>Project/Case Study (Weight 9%)<br>Summative Test (Weight 10%) |

**Evaluation Type and Assessment Weight**

| Type | Assessment Weight |
|---|---|
| Project/Case Study | 61 |
| Task | 19 |
| Summative Test | 20 |
| Total | 100 |

**Assessment and Evaluation of Student Achievement of CLOs**

| SLOs that are charged on the Course | CLO | SUB CLO | Form of Assessment* | | | | Weight | Value | Student Score |
|---|---|---|---|---|---|---|---|---|---|
| | | | Formative | Sumative | | | | | |
| | | | | Project/Case Study | Task | Summative Test | | | |
| SLO-4 | CLO-1 | SUB-CLO-1 | Student understanding of concepts/terms related to mineral deposits | 4 | 0 | 0 | 4 | | |
| SLO-4 | CLO-1 | SUB-CLO-2 | Quality of group assignments (papers) | 4 | 0 | 0 | 4 | | |
| SLO-4 | CLO-1 | SUB-CLO-3 | Accuracy and Sharpness of analysis | 0 | 4 | 0 | 4 | | |
| SLO-4 | CLO-1 | SUB-CLO-4 | Active in discussions | 5 | 0 | 0 | 5 | | |
| SLO-4 | CLO-1 | SUB-CLO-5 | Quality of group assignments (papers and power points | 0 | 5 | 0 | 5 | | |
| SLO-4 | CLO-1 | SUB-CLO-6 | Quality of group assignments (papers and power points) | 0 | 5 | 0 | 5 | | |
| SLO-4 | CLO-1 | SUB-CLO-7 | ▪ Quality of group assignments (papers and power points) | 0 | 5 | 0 | 5 | | |
| SLO-13 | CLO-2 | SUB-CLO-8 | - and ▪ Quality of group assignments (papers) | 4 | 0 | 10 | 14 | | |
| SLO-13 | CLO-2 | SUB-CLO-9 | ▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers) ▪ Activeness in discussions ▪ Quality of brainstorming/ability to express opinions | 4 | 0 | 0 | 4 | | |

| SLOs that are charged on the Course | CLO | SUB CLO | Form of Assessment* | | | | Weight | Value | Student Score |
|---|---|---|---|---|---|---|---|---|---|
| | | | Formative | Sumative | | | | | |
| | | | | Project/Case Study | Task | Summative Test | | | |
| SLO-13 | CLO-2 | SUB-CLO-10 | ▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers) ▪ Quality of percentages ▪ Activeness in discussions ▪ Quality of giving suggestions/ability to express opinions | 4 | 0 | 0 | 4 | | |
| SLO-13 | CLO-2 | SUB-CLO-11 | ▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers and power points) ▪ Quality of percentages ▪ Activeness in discussions ▪ Quality of giving suggestions/ability to express opinions | 9 | 0 | 0 | 9 | | |
| SLO-13 | CLO-2 | SUB-CLO-12 | Student understanding of concepts/terms related to mineral deposits | 9 | 0 | 0 | 9 | | |
| SLO-13 | CLO-2 | SUB-CLO-13 | ▪ Quality of group assignments (papers) ▪ Activeness in discussions ▪ Quality of giving suggestions/ability to express opinions | 9 | 0 | 0 | 9 | | |
| SLO-13 | CLO-2 | SUB-CLO-14 | ▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers) ▪ Activeness in discussions ▪ Quality of brainstorming/ability to express opinions and ▪ Accuracy and sharpness of analysis ▪ Quality of group assignments (papers and power points) ▪ Quality of percentages ▪ Activeness in discussions ▪ Quality of brainstorming/ability to express opinions | 9 | 0 | 10 | 19 | | |
| | | | | 61 | 19 | 20 | 100 | | |