

KUVEMPU UNIVERSITY, DEPARTMENT OF APPLIED GEOLOGY

PROCEEDINGS OF THE UNDER-GRADUATE BOARD OF STUDIES IN GEOLOGY

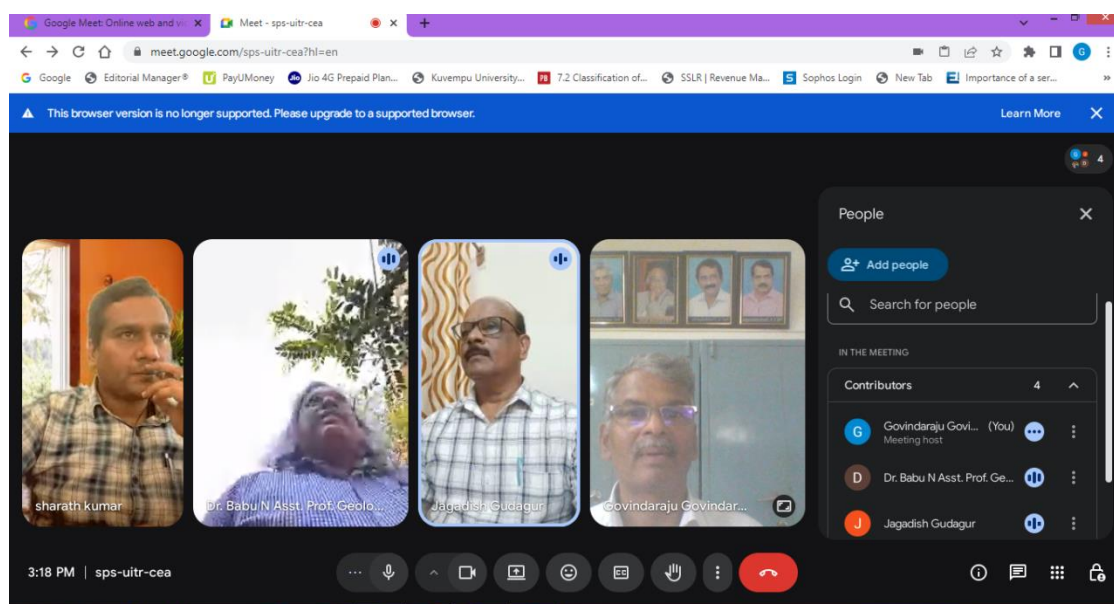
Meeting of the Board of Studies UG- in Geology was held on 20th February, 2026 at 3.00pm through on line (<https://meet.google.com/sps-uitr-cea>) in the Department of Applied Geology, Kuvempu University Shankaraghatta. Since prepared syllabus of practical/skills based compulsory papers of 4th, 5th and 6th semester and adding one more theory paper to fifth and sixth semester B.Sc in Geology have been circulated through mail on 12th February 2026 itself hence, we decided to conduct BOS meeting in online mode.

Members present:

1. Prof Jagadish T Gudugur. Department of Geology, Karnataka Science College, Dharwad
2. Dr. Babu Nallusamy Dept. of Geology, CUK, Kalaburagi
3. Prof. Sharath Kumar P Dept. of Mineral Processing, VSKD University
4. Prof. Govindaraju Department of Applied Geology, Kuvempu University (Chairman)

Members Absent:

5. Prof R Y Budhihal. Department of Geology, Karnataka Science College, Dharwad



Agenda: Adding practical/skills based compulsory papers to 4th 5th and 6th semester B.Sc Geology and adding one more theory paper to fifth and sixth semester B.Sc in Geology and approve the same for the academic year 2025-26

Proceedings:

The Chairman of BOS (UG) greeted all the BOS members and requested to participate effectively to prepare and adding /practical/skill based compulsory paper to 4th 5th and 6th semester B.Sc Geology and adding one more theory paper to fifth and sixth semester B.Sc in Geology and approve the same for the academic year 2025-26. All the board members gone through the syllabus which we have sent through mail on 12/02/2026 finally approved the prepared syllabus in connection with Adding /practical/skill based compulsory paper to 4th 5th

and 6th semester B.Sc Geology and adding one more theory paper to fifth and sixth semester B.Sc in Geology and approve the same for the academic year 2025-26 as mentioned in the table below

Course code	Title of the paper	Subject category	T Hrs	Exam Marks	IA	Total marks	Credits	Exam Duration
MC-IV	Paleontology and Stratigraphy	Theory	3	80	20	100	3	3 Hours
	Paleontology and Stratigraphy	Practical	4	40	10	50	2	3 Hours
	Industrial Minerals	Open Elective	2	40	10	50	2	2 Hours
	Geohazards and mitigation strategies	Open Elective	2	40	10	50	2	2 Hours
	Land Resources	Compulsory	2	40	10	50	2	2 Hours
MC-V	Economic Geology	Theory	3	80	20	100	3	3 Hours
	Economic Geology	Practical	4	40	10	50	2	3 Hours
	Engineering Geology	Theory	3	80	20	100	3	3 Hours
	Water Resources	Compulsory	2	40	10	50	2	2 Hours
MC-VI	Exploration Geology	Theory	3	80	20	100	3	3 Hours
	Exploration Geology	Practical	4	40	10	50	2	3 Hours
	Mining Geology and Field Geology	Theory	3	80	20	100	3	3 Hours
	Mineral Resources	Compulsory	2	40	10	50	2	2 Hours

Finally the chairman thanked all the BOS members for actively participated in preparation of syllabus for above said papers. The BOS chairman also expressed his gratitude for intensive discussion for preparation of syllabus on 16th February 2026 to Dr. Ashok V Rao, consultant Exploration Geologist, Department of mines and Geology, Bangalore for his inputs.

Sl no	Name and Address	BOS	Remarks
01	Prof Jagadish T Gudugur. Department of Geology, Karnataka Science College Dharwad	Member	Presented through online & Approved the syllabus
02	Dr. Sharath Kumar P Dept. of Mineral Processing, VSKD University, PG centre, Nandihalli Sandur Taluk, Bellary dist	Member	Presented through online & Approved the syllabus
03	Dr. Babu Nallusamy Dept. of Geology, CUK Kalaburagi	Member	Presented through online & Approved the syllabus
04	Prof. Govindaraju Department of Applied Geology, Kuvempu University	Chairman	

Signature of Chairman BOS (UG)

KUVEMPU UNIVERSITY
Bachelor of Science (Geology)

Sl No	Course Code	Title of the Paper	Subject Category	Teaching Hours	Semester End Examination	Internal assessment	Total Marks	Credits	Examination Duration
Semester I									
1	MC-I	General Geology, Crystallography and Mineralogy	Theory	3	80	20	100	3	3 Hours
		Crystallography and Mineralogy	Practical	4	40	10	50	2	3 Hours
Semester II									
2	MC-II	Geomorphology, Structural Geology and Hydrogeology	Theory	3	80	20	100	3	3 Hours
		Geomorphology, Structural Geology and Hydrogeology	Practical	4	40	10	50	2	3 Hours
Semester III									
3	MC-III	Petrology	Theory	3	80	20	100	3	3 Hours
		Petrology	Practical	4	40	10	50	2	3 Hours
		Basics of Earth System Science	Open Elective	2	40	10	50	2	2 Hours
		Paleo biology	Open Elective	2	40	10	50	2	2 Hours
		Environmental studies	Compulsory						
Semester IV									
4	MC-IV	Paleontology and Stratigraphy	Theory	3	80	20	100	3	3 Hours
		Paleontology and Stratigraphy	Practical	4	40	10	50	2	3 Hours
		Industrial Minerals	Open Elective	2	40	10	50	2	2 Hours
		Geo hazards and mitigation strategies	Open Elective	2	40	10	50	2	2 Hours
		Land Resources	Compulsory	2	40	10	50	2	2 Hours
Semester V									
5	MC-V	Economic Geology	Theory	3	80	20	100	3	3 Hours
		Economic Geology	Practical	4	40	10	50	2	3 Hours
		Engineering Geology	Theory	3	80	20	100	3	3 Hours
		Water Resources	Compulsory	2	40	10	50	2	2 Hours
Semester VI									
6	MC-VI	Exploration Geology	Theory	3	80	20	100	3	3 Hours
		Exploration Geology	Practical	4	40	10	50	2	3 Hours
		Mining Geology and Field Geology	Theory	3	80	20	100	3	3 Hours
		Mineral Resources	Compulsory	2	40	10	50	2	2 Hours
Grand Total				62	1080	270	1350	46	

KUVEMPU UNIVERSITY
Bachelor of Science (B.Sc) Geology Semester Scheme
Course structure, Scheme of teaching and Evaluation by KSHEC, Govt. of Karnataka
(As per G.O No. ED166UNE 2023, Bengaluru, dated 08-05-2024)

B.Sc Geology course structure and Syllabus Semester wise

Compulsory (Practical Knowledge/skill-1) Fourth Semester
LAND RESOURCES

UNIT-I

Physical Elements: Soil, Soil components, types and properties, major types of soil, soil formation, soil texture, porosity, acidity, Soil erosion: Natural and human induced, desertification Types of Land Use: Agricultural Land: For food and crop production. Forest Land: For timber, biodiversity, and ecosystem services. Grazing Land: For livestock. Wasteland: Unused or degraded land. Built-up/Urban Land: For housing, industries, roads, and settlements.

UNIT-II

Land Degradation: Clearing forests for other uses. Urbanization: Expansion of cities consuming land. Mining: Destruction of vegetation and water systems with respect to sewage water. Soil conservation and land use control: contour farming, terracing, strip cropping, gully reclamation, land use classification, restoring soil fertility. Soil contamination, irrigation problem, salinization and water logging, contamination by hazardous waste,

References;

1. Resource Conservation and Management by G Tyler Miller *Wadsworth Publishing company* -1989
2. Methodology for land use planning – N C Gowtham -2001
3. Technical Guidelines for mapping- IRIS-DA NRSA-2003
4. Sustainable Management of Land Resource - An Indian Perspective- G P Obey reddy e., al 2021
5. Land Resources –Now and Future – Anthont Young

Land Resources – Process, degradation and evolution- HS Sharma and S Padmaja

Open Elective: Industrial Minerals

Unit-I

Introduction to minerals and rocks: Introduction to rock forming and economically important minerals. Principles of rock cycle, origin and classification of economically important mineral deposits. Properties of minerals and rocks, and their occurrences: Physical properties, chemical composition, and diagnostic criteria for the identification of minerals. Ore minerals and gangue minerals, tenor and grade of the ore for industrial processing of minerals. Selection criteria followed for quarrying of decorative and dimensional rock blocks/slabs. National mineral policy.

Unit-II

Properties, occurrences and distribution of the following minerals/rocks in India, with special reference to Karnataka:

Jewelry: gold, diamonds, precious minerals, corals, pearl and opals, sapphires, rubies, and emeralds.

Metallic: Bauxite, chromite, ilmenite, magnetite, hematite, sphalerite, galena, chalcopryrite, pyrolusite.

Cement and Refractory minerals: Calcite, lime stone, gypsum, clay minerals, magnesite, graphite, chalk, marble, dolomite, zircon, kaolin, magnesia and alumina minerals

Ceramics and glass: clay minerals, kaolinite, silica sand and bauxite, limestone and feldspar.

Abrasives, and rock and mineral polishing : industrial diamond, corundum, garnet and quartz magnesite, pumice, and diatomaceous

Electronic and electrical: Rare earth elements, mica, wolframite, native metallic minerals, ores of copper, aluminium.

Strategic/defense: Rare earth elements, Ilmenite, monazite, mica, vanadium from magnetite, poly metallic nodules and rock encrustation in the ocean to extract cobalt and nickel.

Chemicals and fertilizers: Barite, calcite, magnesite, asbestos, diatomite, feldspar, gypsum, kaolinite, phosphorite, mica, talc, zeolite, bauxite, chromite, ilmenite, magnetite, hematite, sphalerite, galena, clay minerals chalcopryrite, pyrolusite, pyrite and monazite.

Dimensional and decorative rocks & dimensional: Marble, granites, gneiss, dolerite, phyllite, slate, sand stones, sand, gravel, pebble and boulders.

Nanotechnology: Clay minerals, ilmenite, polymorphs of carbon, titanium and anhydrous iron oxide minerals and mineral composite for rare mineral substitutes.

Open Elective: Geohazards and mitigation strategies

Unit-I

Geohazards: assessment and planning- Introduction, types of hazards; characteristic features, occurrence and impact of different types, Causes and Strategies for Mitigation of Geological Hazards; Risk assessment, Hazard maps, Land-use planning and hazards **Earthquake, Mitigation Approaches:** Causes, Specific threats, Community impacts, and Mitigation strategies. Characteristic features; Earthquake Risk Mitigation| Magnitude and Intensity of earthquake; Major earthquakes;| Seismic zoning; Earthquake vulnerability of India; Earthquake risk mitigation - Seismic performance examination off RCC. Buildings, retrofitting of vulnerable buildings, Construction of earthquake resistant buildings following proper IS codes, Earthquake preparedness: Case study - Bhuj Earthquake

Unit-II

Volcanic hazards: Introduction, Types of volcanoes, volcanic form and structure, Types of central eruption, Causes of volcanic eruptions, volcanic products: volatiles, volcanic products: pyroclasts, volcanic products: lava flows, Specific threats, Community impacts, volcanic hazard and prediction Mitigation strategies. **Tsunami events, Mitigation Approaches:** An introduction to Tsunami; Magnitude Intensity of a Tsunami; Types of Tsunami; features of Tsunamis: Prediction of Tsunamis: Tsunami Hazard Mitigation. **Flood and Mitigation Approaches:** Types of floods, Causes of floods, Specific threats, Community impacts. Mitigation strategies: Floodplain Management, Flood Insurance, Flood Mitigation Programs, Property acquisitions, retrofitting flood Prone Residential Structures. **Mass Movement:** Soil creep and valley bulging, Causes of landslides, Classification of landslides, Landslides in soils Landslides in rock masses, A brief note on slope stability analysis. Monitoring slopes, Landslide hazard, investigation and mapping, Methods of slope control and stabilization Landslide Specific threats, Community impacts, Mitigation strategies.

Reference:

1. Alexander, D. 1993: Natural disasters. London: UCL Press
2. Alden, W. C., 1928. Landslide and Flood at Gros Ventre, Wyoming, Focus on Environmental Geology, Tank R., Ed., Oxford University Press, New York (1973), 1928, pp. 146–153.
3. Baker, P.E. (1979) Geological aspects of volcano prediction. Journal of Geological Society, 136, 341-346.
4. Bell, F.G., (1999). Geological hazards: their assessment, avoidance, and mitigation. (an imprint of Routledge). E&FN Spon London, UK, Hardbound, ISBN 0419-16970- 9; 631 Pages. September
5. Bell, F.G. (1994) Floods and landslides in Natal and notably the greater Durban region, 1987: a Engineering Geologists, 31, 59-74.
6. Broms, BB., Landslides , retrospective Foundation view. Bulletin Association Engineering Handbook Winterkorn, H. F. and Fang, H.-Y., eds., Van Nostrand Reinhold Co.,

FIFTH SEMESTER

MC-V: Economic Geology

Unit-I

Introduction to Economic geology in relation to industry, essential and critical minerals. Ore minerals, gangue minerals, tenor of ore. Principles and processes of ore formation

Magmatic processes - Early and late magmatic deposits, contact metasomatism - skarn deposits,

Hydrothermal processes - Cavity filling and replacement. **Weathering** - residual and mechanical concentration, Oxidation and super gene enrichment- gossans.

Classification of ore deposits Tensen and Bateman classification

Unit-II

Metallic Mineral resources - Introduction, Study of the following deposits of India with special reference to Karnataka in regard to their mineralogy, origin, occurrence and distribution of **ferrous minerals** – Iron, Manganese, Chromium, Vanadium. **Non-ferrous minerals** – Copper, Lead and Zinc. **Light metals** – Lithium, Magnesium, and Aluminium. **Radioactive minerals** – Uranium and Thorium.

Unit-III

Non-Metallic Mineral resources – Introduction, Study of the following deposits of India in regard to their mineralogy, origin, occurrence and distribution of **Fossil Fuels** – Coal and Petroleum – classification, stages and period of formation. **Abrasive Minerals** – Quartz, Garnet, Diamond, Corundum, Clay. **Industrial Minerals** – Mica, Asbestos, Talc. **Refractory Minerals** – Fire clay, Graphite, Dolomite. **Ceramic Minerals** - Clay and Feldspar, **Fertilizer Minerals** – Phosphate and Potash

Reference Books:

1. Economic mineral deposits -A M Bateman
2. Ore deposits of India – Gokhale and Rao
3. Indian mineral resources -S Krishnaswamy
4. Introduction to India's economic minerals - N.L. Sharma and KS Ram

MC-V ENGINEERING GEOLOGY

Unit-I

Introduction, Definition, scope and importance of Engineering Geology, role of geology in civil engineering and infrastructure projects. Soil formation and profile, engineering properties of soil – Unit Weight, Specific Gravity, Bulk Density, Porosity, Void Ratio, degree of saturation. Engineering properties of rocks – strength, hardness and elasticity, porosity, specific gravity and rock characteristics. Concept of rock quality determination (RQD) and its application.

Joints: - Genetic-columnar, mural, sheet joints, Master joints. Importance of joints.

Faults-definition, elements of faults- fault plane, dip, strike, hade, heave and throw, hanging and foot wall. Genetic:-Thrust faults, over thrust, under thrust. Gravity faults-step fault, ridge fault, trough fault, Criteria for recognition of faults in the field. Lineation and foliation.

Unit-II

Engineering structures – **Dams** – definition, parts of dam, types of dams – gravity, arch, embankment, buttress. **Tunnels** – definition, parts and types of tunnels – traffic tunnels, hydropower tunnels, utility tunnels. **Bridges** – definition, parts of bridges, and types of bridges – pier bridges, arch bridge, suspension bridge, cantilever bridge. Roads and Highways.

Unit - III

Various stages of engineering geological investigation for civil engineering projects. Geological consideration for evaluation of dams and reservoirs, tunnels, bridges, roads and highways. Improvement of sites – Introduction, grouting, rock bolting, soil stabilization. Earthquake and seismicity, terms of earthquakes, classification of earthquakes, seismic zones of India, design of buildings in earthquake zones.

Reference Books:

1. Engineering Geology – Subinoy Gangopadhyay – Oxford University Press
2. Engineering Geology – S K Duggal, H K Pandey, N Rawal - McGraw Hill Education (India) Private Limited, New Delhi
3. Engineering Geology – Principles and Practice - M. H. de Freitas
4. Engineering and General Geology- Perbin Sing
5. Fundamentals of Engineering Geology - F G Bell

Practical: MC-V: Economic Geology

Economic Geology: Study of Ore minerals - Copper, graphite. Sulphur, chalcopyrite, azurite, malachite, realgar, orpiment, cinnabar, galena, Sphalerite, pyrite, ilmenite, pyrolusite, psilomelane, bauxite, chromate, Limonite, coal and its varieties.

Compulsory (Practical Knowledge/skill-2) fifth Semester WATER RESOURCES

UNIT-I

Definition & Importance: Types of water resources (surface, ground, frozen), global/Indian scenarios. **Hydrologic Cycle:** Precipitation, evaporation, transpiration, infiltration, and runoff. **Water Uses:** Agricultural, industrial, domestic, and environmental sectors. **Hydrology and Water Assessment:** **Surface Hydrology:** River systems, streamflow measurement, and discharge calculation. **Groundwater Hydrology:** Aquifers, wells, seepage analysis, and recharge techniques. **Assessment Tools:** Data collection, sampling methods, and water balance studies.

UNIT-II

Water Quality and Pollution Control: Parameters like Physical, chemical, and biological characteristics (pH, turbidity, BOD, COD, DO, Hardness). **Standards & Pollution:** Drinking water standards, effluent standards, and pollution causes/effects. **Treatment Basics:** Unit operations in water and wastewater treatment. **Water Resources Engineering & Structures:** **Hydraulic Structures:** Basics of dams, reservoirs, weirs, and barrages. **Irrigation Engineering:** Canal networks, diversion head works, and crop water requirements. **Flow Mechanics:** Open channel flow and sediment transport. **Management and Conservation:** **Watershed Management:** Concepts and practices. **Sustainability:** Rainwater harvesting, water footprint, and conservation methods. **Challenges:** Floods, droughts, river disputes, and climate change impacts.

References

1. Groundwater Hydrology– D.K.Todd – John Wiley and Sons (2nd Ed.) Inc. New York.
2. Hydrogeology– C.W.Fetter – Merrill Publishing (2nd ed.) Co. U.S.A.
3. Hydrogeology - K.R.Karanth – Tata McGraw Hill Publishing Co. Ltd.
4. Ground Water Assessment, Development and Management – K.R.Karanth– Tata McGraw Hill Publishing Co. Ltd.

5. Groundwater – H.M.Raghunath – Wiley Eastern Limited
6. Hydrology – H.M.Raghunath– Wiley Eastern Limited
7. Elements of Hydrology – V.P.Singh
8. Engineering Hydrology – K.Subramaniam - Tata McGraw Hill Publishing Co Ltd.
9. Applied Hydrology – Mutreja, K.N. - Tata McGraw Hill Publishing Co. Ltd.
10. Elements of Hydrology – V.P.Singh
- 11.

SIXTH SEMESTER

MC-VI: Exploration Geology

Unit-I:

Introduction: Principles and methods of geo-exploration: geological, geophysical and geochemical. **Geological Exploration:** Introduction- indication of ore - outcrop, gossans and wall rock alterations, guides to ore- physiographic, mineralogical, stratigraphic, lithological and structural. **Stages of exploration** – Reconnaissance, Prospecting, General Exploration, Detailed Exploration. **Techniques of Exploration** – Detailed Mapping, Pitting and Trenching, Borehole Drilling, Sampling methods.

Unit-III

Geochemical Exploration: Introduction, principles of geochemistry. Geochemical environments, concept of geochemical anomalies, geochemical cycle, mobility and dispersion of elements, Mode of occurrence of major and trace elements. Geochemical classification of elements (Goldsmith's classification), Geochemical provinces, geochemical methods in mineral exploration – Bedrock method, Soil Geochemical method, Stream Sediment Geochemical method, Hydro-geochemical method, Geo-botanical and bio-geochemical method - pathfinder elements and their significance.

Unit-III

Geo-Physical Exploration: Introduction, Physical fields, geophysical anomalies. **Electrical methods of prospecting** – resistivity, conductivity, prospecting for ground water - electrical resistivity method. Wenner and Schlumberger methods. VES curves, types of curves and curve matching techniques. **Magnetic methods** - magnetometers - torsion – vertical force and horizontal force, airborne – flux gate magnetometer. **Gravity methods** - gravitational force of the earth, Worden gravimeter, Gravity corrections - latitude free air. Bouguer, terrain, tidal. **Seismic methods** - types of seismic waves, principles of refraction and reflection techniques.

Reference Books:

1. An outline method of geophysical prospecting - MB Ramachandra Rao
2. Introduction to Geophysical prospecting – Dobrin
3. Principles of geo chemical prospecting - Ginzberg and Soklov
4. Principles of Geochemistry - White
5. Environmental Geochemistry - Bhattacharya A

MINING GEOLOGY

Unit-I

Field Geology: Introduction to field geology, preparation before fieldwork, field equipments – compass clinometer, Brunton compass, GPS, field notebook, topographic map, pencils, hand lens, scale. Traversing methods – compass and GPS traversing, measuring dip and strike in the field, recording lithological and stratigraphical successions, collection, labelling and preservation of samples, interpretation of field data and geological relationships. Preparation of geological report.

Unit-II

Introduction, terminology of mining – exploration development, pit, benches, haul road, shaft, tunnel, audit, drive, stope, raise, winze, cross-cut, level, ore bin. Classification of mining methods – **Alluvial methods** – pan and bate, rocker, long tom, sluicing, derricks and cableways, hydraulicking. **Surface mining methods** - Open cast/pit mining, quarrying, contour mining, mountain top removal. **Underground mining methods** – supported and open stope methods, coal mining methods, machineries used in mining.

Unit-III

Ore reserve estimation: ore reserves and their classification, grade, tonnage and their relationship. Methods of ore reserve estimations - conventional and geo-statistical. **Drilling** - definition, types of drilling, drilling bits. Advantage and disadvantage of surface and subsurface mining, impacts of mining on environment. Mine safety, mine ventilation, mine legislation - Mines and Minerals (Development and Regulation) (MMDR) Act, 1957, Mines Act, 1952, Coal Mines Regulations, 2017.

Reference Books:

1. Mining geology - Arogya swamy
2. Elements of mining geology - young
3. Elements of mining- Lewis
4. Elements of mining – Clark G B
5. Mining of mineral deposits – Shaevykov
6. Field geology - F H Lahee

Practical: Exploration and Field Geology

Geophysical problems:

1. Seismic method – Reflection and refraction, calculation of thickness of beds by using critical distance and intersect time and graphical representation.
2. Gravity method: Gravity anomaly, gradient, curvature, Problems and plotting, gravity correction problems
3. Magnetic method: Magnetic anomalies, calculation of vertical and horizontal component for given problems and plotting.
4. Electrical conductivity/ resistivity-calculation of factor, plotting of four type of resistivity curves.
5. Reading of SOI topomap, Preparation of base map: Contour, Drainage, Road settlements.
6. Field mapping: Visit to field for collection of ground data - location, measurements of dip and strike of different litho-units and preparation of thematic maps.

**Compulsory (Practical Knowledge/skill-3) sixth semester
MINERAL RESOURCES**

UNIT-I

Mineral Resources

Definition: Minerals and Ores: Physical Properties: Hardness (Moh's scale), luster, color, cleavage, fracture, and crystal form diaphenity, streak sp gravity composiotion

Classification of Mineral Resources: Metallic Minerals: Contain metals, shiny, good conductors (e.g., Iron, Copper, Gold). *Ferrous:* Contain iron (Iron ore, Manganese). *Non-Ferrous:* Do not contain iron (Copper, Bauxite, Lead). **Non-Metallic Minerals:** Do not contain metals, often industrial (Limestone, Mica, Gypsum). **Energy Minerals (Mineral Fuels):** Used for energy production (Coal, Petroleum, Natural Gas, Uranium).

UNIT-II

Renewable/ Critical minerals: critical minerals are essential components of various clean energy technologies and industries. Their importance can be highlighted across different sectors:

Solar energy: Critical minerals such as **silicon, tellurium, indium, and gallium** are vital for the production of photovoltaic (PV) cells used in solar panels.

Wind energy: Rare earth elements are used in permanent magnets for wind turbines., necessitating a stable supply of these minerals.

Electric vehicles (EVs): Lithium, nickel, and cobalt are key materials used in lithium-ion batteries., leading to increased demand for these critical minerals.

Energy storage: Lithium-ion batteries used in advanced energy storage systems depend on **lithium, cobalt, and nickel**.

Distribution of Minerals: Geographical distribution (Global and National contexts, e.g., Mineral belts in India). **Conservation and Management: Characteristics:** Uneven distribution, exhaustible nature, and slow geological formation. **Sustainable Use:** Recycling metals, improved technologies, reducing waste, and finding alternatives. **Environmental Impact:** Effects of mining and exploitation.

References

1. Ore Geology and Industrial Minerals - Evans, A.M., 1993: Blackwell
2. Metal deposits in relation to plate tectonics - Sawkins, F.J., 1984: Springer Verlag
3. Economic Geology and Geotectonics -Torling, D.H., 1981: blackwellSci publ.
4. Ore petrology – Stanton McGraw hill Publ
5. Ore Petrography and Mineralogy - Craig, J.M. & Vaughan, D.J., 1981: John Wiley
6. Ore Petrography - Stanton, R.L., 1972: McGraw Hill
7. Mining Geology – P Arogyaswamy
8. Elements of Mining Geology – Young
9. Mineral processing – S K Jain

Theory Question Paper Model
B.Sc. Semester-I Degree Examination; 2024-2025
(Semester Scheme; New Syllabus: 2024-25)
Paper-I: General Geology, Crystallography and Mineralogy
Paper Code:

Time: 3 Hours

Max.

Marks: 80

Instruction to candidates:

- 1) All sections are compulsory
- 2) Draw neat and labeled diagram wherever necessary

Section-A

1. Answer **all** the Following questions:

(2x10=20)

- a)
- b)
- a)
- b)
- c)
- d)
- e)
- f)
- g)
- h)

Section-B

Answer **any Six** of the Following questions:

(5x6=30)

- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.

Section-C

Answer **any Three** of the Following questions:

(10x3=30)

10. Question from Unit-I
11. Question from Unit-II
12. Question from Unit-III
13. Question from any Unit

Open elective Question Paper Model
B.Sc. Semester- III& IV Degree Examination; 2024-2025
(Semester Scheme; New Syllabus: 2024-25)
Paper-I: Basics of Earth System Science
Paper Code:

Time: 2 Hours

Max. Marks: 40

Instruction to candidates:

- 1) All sections are compulsory
- 2) Draw neat and labeled diagram wherever necessary

Section-A

Answer **all** the Following questions: **(2x5=10)**

- 1.
- 2.
- 3.
- 4.
- 5.

Section-B

Answer **any Six** of the Following questions: **(5x6=30)**

- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.

Practical paper Examination I-VI semesters

Duration: 3Hrs

- | | |
|--|----------|
| • Experimentation (Major & Minor /Spotters) – | 30 Marks |
| • Viva Voice- | 10 Marks |
| Total | 40 Marks |

Internal assessment for Practical paper from I to VI semesters

- | | |
|--------------|----------|
| • Attendance | 05 Marks |
| • Record | 05 Marks |