## UNIVERSITY OF MYSORE
### B.SC., GEOLOGY - COURSE STRUCTURE AND ALLOCATION OF MARKS
#### (REVISED) 2014

<table>
<thead>
<tr>
<th>Semes ter</th>
<th>Paper</th>
<th>Title of the paper</th>
<th>Theory</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of teaching hours</td>
<td>Marks</td>
<td>No. of Praticals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exam</td>
<td>IA</td>
<td>Exa m</td>
</tr>
<tr>
<td>First</td>
<td>Paper I 20035*</td>
<td>Introduction to Earth system-I and Crystallography</td>
<td>42</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Practical I A542*</td>
<td>Crystallography</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Second</td>
<td>Paper II 20135*</td>
<td>Introduction to Earth system-II and Mineralogy</td>
<td>42</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Practical II B542*</td>
<td>Mineralogy</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Third</td>
<td>Paper III 20233*</td>
<td>Petrology</td>
<td>42</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Practical III C542*</td>
<td>Petrology</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Fourth</td>
<td>Paper IV 20332*</td>
<td>Paleontology and principles of stratigraphy</td>
<td>42</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Practical IV D542*</td>
<td>Paleontology</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Fifth</td>
<td>Paper V 20446*</td>
<td>Indian stratigraphy and structural geology</td>
<td>42</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Practical V E544*</td>
<td>Structural geology</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Paper VI 20447*</td>
<td>Economic geology and engineering geology</td>
<td>42</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Practical VI E546*</td>
<td>Tracing of outcrops, dip and strike problems</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Sixth</td>
<td>Paper VII 20648*</td>
<td>Remote sensing and geoexploration</td>
<td>42</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Practical VII F90*</td>
<td>Petrographic techniques-I</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Paper VIII 20649*</td>
<td>Gemology, optical mineralogy, hydrogeology and mining geology</td>
<td>42</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Practical VIII F90*</td>
<td>Petrographic techniques-II and ore geology and field report</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

**Note:** * (star) denotes code nos.
Paper -1 Introduction to Earth System-I and Crystallography

Dynamics of the earth-I

<table>
<thead>
<tr>
<th>Th</th>
<th>IA</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>10</td>
</tr>
</tbody>
</table>

UNIT-1
Definition of geology, relationship with other branches of science, importance, scope and different branches of geology.
Components of earth system: atmosphere, lithosphere, hydrosphere, biosphere.
Origin of earth; nebular hypothesis.

UNIT-2
Age of the earth: radiometric methods (Rb-Sr, U-Pb, Sm-Nd, Pb-Pb) of age determination.
Geological agents: definition, classification- a) epigene and b) hypogene

EPIGENE AGENTS:
Weathering: types, mechanical, chemical and biological weathering
Wind: geological action of wind, deflation, abrasion, attrition, erosional features- pedestal rock, transportation-suspension, saltation, traction, deposition-sand dunes, barchans, and loess.

UNIT-3
Erosional features-m pot holes, V-shaped valleys, waterfall, canyons, base level erosion, meanders, oxbow lake, transportation-suspension, solution, saltation, deposition-alluvial fans and deltas, groundwater: geological action of ground water- Erosional features-sinks, caverns, solution valleys-transportation-solutional, depositional features-concretions, stalactites and stalagmites.
Oceans: topography of ocean floor continental slope, shelf abyssal zone, mid ocean ridges, waves, tides, currents and circulation of waters.

UNIT-4
Geological work of oceans-erosion, transportation, deposition.
Coral reef: types of reefs- fringing, barrier, atoll.
UNIT-5
CRYSTALLOGRAPHY
Introduction: definition and scope of crystallography, definition of a crystal, formation of crystals: crystalline and amorphous substances, crystal elements: interfacial angle, contact goniometer. Crystallographic axes; axial characters of geometrical constants; axial ratio; classification of crystals in to systems based on geometrical constants.

UNIT-6

Books:
1. Principles of geology-Arthur Holmes
2. Physical geology-Longwell and flint
3. General geology-Radhakrishna y
4. The dynamic earth-Wyllie P.J
5. The way earth works- Wyllie P.J
6. Physical geology-Spring Field
7. Geomorphology-Thornbury
8. Geomorphology-Cavies
9. Physical geography today-Muller and Oberlander
10. An introduction to crystallography-Buerger
11. Elementary crystallography- Buerger
12. Crystallography and crystal chemistry-Bloss D
14. Elements of X-rays crystallography-Axaroff
15. An introduction to crystal chemistry- Evan.R.C.
PRACTICAL (PR-1) CRYSTALLOGRAPHY

Prac. 3hrs/week

The study of mathematical relationships of crystal elements (Euler’s formula) F+A=E+2, classification of crystals into six systems on the axial characters. Measurement of interfacial angle using contact goniometer. The study of symmetry elements (grade of symmetry) in crystals. Simple holohedral forms of the six systems and Twins.

Total 14 hrs

SECOND SEMESTER

Paper- 2. INTRODUCTION TO EARTH SYSTEM-II AND MINERALOGY

UNIT-1
Dynamics of The earth-II
HYPOGENE AGENTS:
Volcanoes: definition, description of typical volcano, classification of volcanoes-active, dormant, extinct, central, fissure, product of volcanoes, hot springs, geysers, fumaroles, causes of volcanoes.
Earthquake: definition, focus, epicenter, causes and effects of earthquakes, seismic waves-P, S, and L waves, seismograph, recent earthquakes in India.

7 hrs

UNIT-2
Plate tectonic theory: Plates and their margins, constructive margin, destructive margin, continental plate boundaries, ocean plate boundaries, causes of movement of the plates, paleo magnetism, seafloor spreading and hotspots.

7 hrs

UNIT-3
MINERALOGY
Introduction: definition of mineral, history of mineralogy, branches of mineralogy.
Physical mineralogy: characters depending upon the state of aggregation –habit, form. Characters depending upon cohesion and elasticity: cleavage, fracture, hardness, tenacity.
UNIT-4
Characters depending upon light: color, streak, luster, diaphaneity, iridescence, opalescence, luminescence, fluorescence, phosphorescence, tarnish. Characters depending upon electricity and magnetism: conductivity, pyro, piezo, para and diamagnetism.
Specific gravity and methods of determining specific gravity: Isomorphism and Polymorphism.

UNIT-5
Descriptive Mineralogy: classification of minerals based on chemical composition. Oxides and carbonates, silicates, abundance in the crust, classification of silicates, based on structures: neo, soro, cyclo, iono, phyllo and tecto silicates.

UNIT-6
Study of group of minerals: garnet group, pyroxene group, amphibole group, mica group, quartz and feldspar groups.

Books:
1. Principles of Geology-Arthur Holmes
2. Physical geology-Longwell And Flint
3. General geology-Radhakrishna Y
4. The dynamic earth-Wyllie P.J.
5. Mineralogy, Crystallography & Crystal Chemistry – Bloss.D
6. Textbook of Mineralogy – Dana
8. Mineralogy – Shrock
10. Optical mineralogy- Naidu,P.R.J.
11. Optical mineralogy- Kerr. P.J.

PRACTICALS (PR II): MINERALOGY
Prac 3hrs/week

Identification of the following minerals based on their physical characters.
2. Carbonates: Calcite, Magnesite, Siderite, Rhodochrosite, Dolomite.
5. Silicates:
   Nesosilicates: Olivine, Garnet, Zircon, Andalusite, Sillimanite, Kyanite, Topaz, Staurolite
   Sorosilicates: Epidote
   Cyclosilicates: Beryl, Tourmaline.
   Inosilicates:
   Pyroxenes: Enstatite, Hypersthene, Diopside, Augite.
   Amphibole: Hornblende, Tremolite, Actinolite.
   Phyllosilicates: Serpentine, Talc, Muscovite, Vermiculite, Biotite, Epidote, Chlorite.
   Tectosilicates: Quartz and its varieties.
   Feldspars- Microcline, Orthoclase, Plagioclase- Labradorite.
   Feldspathoids- Leucite, Nepheline, Sodalite

Total 14 hrs

THIRD SEMESTER

Paper-3. PETROLOGY

UNIT-1
Introduction. Definition of a rock, relationship of petrology with other branches of Geology, composition of the earth’s crust classification of rocks, igneous, sedimentary and metamorphic rock, rock cycle.


UNIT-2

UNIT-3
Classification: Bases of classification- chemical, mineralogical and textural. Tabular classification of Tyrrell. Petrogenesis- Introduction-concept of system, phase and component, chemical potential and phase rule. Unicomponent system (SiO2) and Binary systems (Fo-Fai,
Ab-An) magma, lava, types of magma, temperature of magma, composition of magma, crystallization of binary magma. Bowen’s reaction principle, differentiation and assimilation.

7 hrs

UNIT-4

Sedimentary rocks: Sedimentation - Weathering, transportation, lithification and diagenesis. Structures of Sedimentary rocks; ripple marks, sun cracks, rain prints, stratification, current bedding and graded bedding. Size and shape of the grains, and cementing material. Classification based on mode of formation- residual, mechanical, chemical and organic. Based on grain size - rudaceous, arenaceous, argillaceous.
Depositional environment - terrestrial, laccustrine, fluvial, marine.

7 hrs

UNIT-5

Metamorphic rocks: Agents of metamorphism, kinds of metamorphism–Contact (thermal), Regional (dynamothermal) and its grades, dynamic (cataclastic), plutonic, pneumatolytic.

7 hrs

UNIT-6

Structures -gneissose, schistose, granulose. Effects of thermal metamorphism on argillaceous sediments and calcareous sediments. Effects of regional metamorphism on argillaceous sediments and basic igneous rocks.

7 hrs

Books:
3. Sedimentary rocks by Pettijohn 1984 - CDS Pub\ NEW DELHI
4. Sedimentary rocks by Greensmith 1984
6. Petrology of Sedimentary rocks - Folk. R.L.

Total 42 hrs

PRACTICAL (PR III) PETROLOGY

Prac. 3 hrs/week

Identification of rocks: megascopically study

Igneous rocks: granite, syenite, diorite, gabbro, peridotite, Dunite, porphyries, granite, syenite, diorite, felsites, pegmatite, dolerite, obsidian, pitchstone, rhyolite, trachyte, basalt, andesite.

Sedimentary rocks: conglomerate, breccia, sandstone, shale, grit, limestone, shell limestone, oolitic limestone.

Metamorphic rocks: quartzite, schist, gneiss, marble, slate, phyllites, charnockite, granulites and basic granulites.

Total 14 hrs
FOURTH SEMESTER

Paper-4. PALEONTOLOGY AND PRINCIPLES OF STRATIGRAPHY

Th  IA
Theory 3h/week  60  10

UNIT-1
PALEONTOLOGY
Introduction: Definition, relationship with other branches of geology, classification of life plant and animals- invertebrates and vertebrates-phylum, class, order, genera, species, fossils, fossilization, different modes of fossilization; mummification, carbonization, petrification, casts and moulds, tracks and trails. Types of fossils- index, extinct, synthetic and persistent fossils with examples. Micropaleontology, utility of fossils. Uses of fossils in stratigraphic classification, paleogeography, evolution of life and in the exploration of fossil fuels. Life through ages.

UNIT-2
PALAEONTOLOGY-2
Phylum Protozoa: Order: Foraminifera- General morphology, test wall- calcareous, chitinous, and agglutinated- septa, arrangement of chambers, suture, aperture, dimorphism, classification, geological history and stratigraphic importance. An outline on the applications of foraminifera in oil exploration.

Phylum Cnidaria:
class Anthozoa: General morphology, corallum, corallite, theca, chambers, septa, tabulae, dissepiments, sinapticulae, fossula, columella, septal developments, classification- rugose corals, tabulate corals and modern corals, geological range and stratigraphic importance.

Phylum Echinodermata; class: Echinoidea- Morphology of the shell, regular and irregular echinoids: Apical system- ambulacral and interambulacral areas, peristome.

A brief outline on the classification of vertebrates - A very short account of the evolution of man, elephant and horse. Gondwana flora of India. An outline of the uses of Micropaleontology.

Phylum: Hemicordita, Subphylum; Graptolithina: Order: Graptoloidea: General morphology, rhabdosome stipe, theca, common canal, nema, virgula, sicula, uniserial, biserial, classification, geological distribution and stratigraphic importance.

UNIT -3
Phylum Mollusca:
Class – Pelecypoda(Lamellibranchia): General characters-soft parts, shell, umbo hinge line,
ligament, lunule and escutcheon- adductor impressions, pallial line, pallial sinus, dentition, ornamentation, classification, geological history.

Class – **Gastropoda**: General characters- soft parts, shell, shell forms, whorl, spire, suture aperture-( holostomatus, siphanostomatus) columella, umbilicus, peristome, types of coiling- dextral & sinistral, orientation, ornamentation, classification and geological history.

Class- **Cephalopoda**: General morphology. **Nautiloidea** - morphology, shell, brief description **Ammonoidea** - Morphology, siphuncle, septa, septal necks. prosiphonate, retrosiphonate, chambers, protoconch, phragmacone, body chamber, suture lines- saddles, lobes, suture type- nautilitic, goniatitic and ammonitic- shell forms, ornamentation classification- evolution (size, coiling, suture), geological history.

7 hrs

**UNIT -4**
Phylum **Arthropoda**:

Phylum **Brachiopoda**: General characters- soft parts, shell, beak, umbo, pedicle opening, delthyrium, deltidial plates, hingeline, articulata & inarticulate, teeth & sockets, brachial skeleton, ornamentation- classification, geological range in time.

7 hrs

**UNIT-5**
**PRINCIPLES OF STRATIGRAPHY:**
Introduction; principles of stratigraphy; law or catastrophism, law of unifromatarian, law of order of superposition, nature of geological record, imperfections in geological record.

7hrs

**UNIT-6**
Correlation: Types of correlation, criteria for stratigraphic correlation; lithological, stratigraphical, structural, metamorphic, paleontological (biological), geochronogical.
Standard stratigraphical record and its equivalents in India. Classification of geological record into Archaean, Proterozoic, 9aleozoic, Mesozoic and Cenozoic.

7 hrs

Total 42 hrs

Books:
1. Principles of paleontology- Wood,H
2. Principles of paleontology- Sweinnerton.H.M
3. Introduction to paleontology- Jain.P.C.amd Anantharaman.M.S.
4. Paleobotany-Andrews
5. Principles of invertebrate paleontology- Shrock. RR. And Twenhofel.H
7. Vertebrates-Colbert C
8. Vertebrate paleontology- Romer A.

PRACTICAL (PR IV) PALEONTOLOGY

Megascopic identification and description of the following fossils:

**Corals:** Calceola, zapherentis, lithostrotion, favosites, halysites.

**Brachiopoda:** Spirifer, producters, terebratula, rhyconella, atrypa.

**Pelecypoda:** Cardita, pectin, trigonia, gryphea, hippurites.

**Echinodermata:** cidaris, micraster

**Gastropoda:** Natica, turritella, cerithium. conus, voluta, physa.

**Cephalopoda:** Nautilus, goniatites, ceratites, acanthoceras, hamites.

**Trilobita:** Paradoxide, calamene, phacops, trinucleus.

Identification of Micro fossils: Foraminifera: lagena, nodosaria, textularia,
Techniques of separation of microfossils from the sediments.

**Plant fossils:** Calamites, Lepidodendron, Sigillaria, Glossopteris, Ptilophyllum, and Cordiates.

Total 14 hrs

FIFTH SEMESTER

Paper 5.1 INDIAN STRATIGRAPHY AND STRUCTURAL GEOLOGY

**INDIAN STRATIGRAPHY**

**UNIT-1**
Physiographic divisions of India- Peninsular, Extra-peninsular and Indo-gangetic alluvial plains.
Archaeans of Peninsular India, Distribution- Karnataka. Sargur group and Dharwar super group.
Proterozoic (Purana group) basins of Karnataka- Cuddapah, Kaladgi, Badami, Bhima, Karnool group.
Cambrian rocks of Spiti- Distribution, lithology, classification and a brief account of fossil record.

7 hrs

**UNIT 2:**
Gondwana stratigraphy- Nomenclature, lithology, distribution, classification, age, economic deposits and a brief account of plant fossil record.
Cretaceous rocks of Tiruchirapalli- Distribution, lithology, classification, life and age limit.

7 hrs
UNIT-3

7 hrs

UNIT-4
STRUCTURAL GEOLOGY

7 hrs

UNIT-5
SECONDARY STRUCTURES:

7 hrs

UNIT 6:


7 hrs

Books:
1. Field Geology - Lahee, W.
2. Structural Geology - Billings, M.P.

Total 42 hrs
4. Topographic sheets - Survey of India Publ.
5. Geological Map of India and Karnataka
6. Indian Stratiigraphy - Wadia, D.N.
7. Geology of India and Burma - Krishnan, M.S.

**Paper 5.2 ECONOMIC GEOLOGY AND ENGINEERING GEOLOGY**

| Theory 3hr/week | 80 | 20 |

**UNIT-1:**

7 hrs

**UNIT-2**

7 hrs

**UNIT-3:**
**Indian mineral deposits**
Study of the following deposits of India with special reference to Karnataka with regards to their mineralogy, origin, occurrence and distribution.
**Metallic deposits:** gold, copper, iron, manganese, aluminium, chromium
**Non-metallic deposits:** mica, abrasives, refractories, building and ornamental stones

7 hrs

**UNIT-4:**
**Fossil fuels**
Petroleum and coal: petroleum-origin, migration and accumulation of oil. Oil taps, on-shore and off-shore oilfields of India. Coal-stages and periods of coal formation, lower gondwana coal fields, peat and lignite deposits.

7 hrs

**UNIT-5**
ENGINEERING GEOLOGY


UNIT-6

Tunnels: terminology, definition, types- hard rock and soft rock tunnels.

Bridge sites: Terminology, Bridge structure, types, bridge problems, and stability of bridges. Geology of bridge sites.

Books:
1. Economic Mineral Deposits - Jenson and Bateman, A.M
2. Mineral Deposits by Lindgren
3. Ore Deposits by Park and Mc Diarmid
4. Ore-deposits of India - Gokhale and Rao
7. Introduction to India's economic minerals - Sharma, N.L. and Ram. K.S.
8. A treatise on Industrial Minerals of India - Sinha. R.L.
9. Structural Geology - Billings, M.P.

PRACTICAL (PR V): STRUCTURAL GEOLOGY

Th IA
Prac. 3h/week 40 10

Study and Interpretation of Topographical Maps: Description of the relief features and drawing of profile of contour maps. Geological Maps – Drawing of section and interpretation. Horizontal series and inclined series without intrusive and with intrusive rocks.

Faults: vertical and inclined with intrusive rocks. Folded series, unconformity series. Complex map consisting of folds, faults, unconformities and intrusions.

A total of 20 maps covering the above topic.

Total 14 hrs
PRACTICAL (PR VI): TRACING OF OUTCROPS, DIP AND STRIKE PROBLEMS.

Tracing of outcrops, dip and strike problems.
1. Determination of the amount of apparent dip in the given direction, from given amount and direction of true dip.
2. Determination of true dip, when the amount and direction of apparent dips are known.
3. Determination of the apparent dips, when the true dip amount and directions are known.
4. Determination of the direction of the apparent dip, when the true dip and amount of apparent dips are known.

Calculations of the thickness of the strata, horizontal surface, slope in the direction of dip and slope against the direction of dip.

Total 14 hrs

SIXTH SEMESTER

Paper 6.1 REMOTE SENSING AND GEOEXPLORATION

UNIT-1
Remote sensing using aerial photograph. Types of aerial photography—controlling factors of aerial photography. Scale of photography. Flight plan—area, purpose—time and season. Overlap, sidelap, drift and crab. Types of mosaics and camera parameters. Phogrammetry and instrumentation in aerial photography.

UNIT-2
Satellite Remote Sensing: Principles of Remote sensing, stages in remote sensing. Electromagnetic radiation—characteristics of electromagnetic spectrum; interaction of EMR with the earth’s surface (reflection, surface roughness, transmission, spectral signature) and with the atmosphere (scattering, absorption, atmospheric windows, refraction, atmospheric haze). Platform, sensors, resolution, multispectral scanners—across-track and along-track multispectral Scanning, data reception and product generation. Microwave remote sensing: SLAR & SAR, LISS, NIR, TIR and different Indian satellites in brief, NRSA centers, RRSSC centers, IIRS centers and activities with respect to Indian satellite data products.
UNIT-3
GEOEXPLORATION:

GEOLOGICAL EXPLORATION
Guides and criteria for locating ore deposits. Stratigraphic, lithological, structural, geomorphological, palaeogeographic and palaeoclimatic Criteria. Preliminary and detailed exploration, exploratory works – drilling and core logging, exploratory grids, sampling methods, economic evaluation of mineral deposits.

UNIT-4
GEOPHYSICAL EXPLORATION
Introduction: Methods of Exploration.
Gravity Method: Introduction, basic principle, gravity of the earth, gravity reductions, densities of rocks and minerals, density estimates from field results, Gravimeters-Stable type, field operations, results and interpretation.
Magnetic Method: Introduction, Basic principle, Magnetism of the Earth, Magnetism and magnetic susceptibilities of rocks and minerals, Field instruments, field operations. Results and interpretation.
Seismic Methods: Introduction, principles of reflection and refraction methods, field equipments – Geophones, results and interpretation.

UNIT-5
GEOCHEMICAL AND BIO-GEOCHEMICAL EXPLORATION

UNIT-6
FIELD GEOLOGY
Introduction, field equipments, a brief note on taking geologic notes in the field, collection of samples, numbering and marking specimens. Determination of dip and strike using compass clinometer and Brunton compass. Types of maps- topographic, geologic and aerial photographs. Study of toposheets. General survey procedures, selecting and preparation of a base map, detailed mapping and sampling and their types. Preparing of geological reports.
Books:
1. Introduction to photogrammetry by Wolf
3. Photogeology – Miller J.C
4. Photogeology by S.L.Pandey
5. Principles of remote sensing –A.S.Patel and Surendra Singh
8. Biochemical methods of Prospecting - Malyuga, D.P.

Paper 6.2 GEMOLOGY, OPTICAL MINERALOGY, HYDROGEOLOGY AND MINING GEOLOGY

UNIT-1
GEMOLOGY
Introduction- a brief history of gemstones. Carot, colour, clarity, inclusion, gem defects, water and fire. A detailed study of important gem materials, their characters and occurrences- Indian occurrences in particular:
Precious varieties: a) diamond b) Ruby c) Sapphire d) Topaz e) Emerald f) Aquamarine g) Pearls h) Zircon
Semi precious varieties: a) star ruby b) star sapphire c) Spinels d) Garnets- different varieties e) Malachite f) Lapis lazuli g) Turquoise h) Moonstone g) tiger’s eye.
Synthetic gemstones and its importance, gem cutting techniques.
7 hrs

UNIT-2
OPTICAL MINERALOGY (Petrographic techniques)
Refractive index, Critical angle, Total reflection. Double refraction- Isotropic and Anisotropic crystals, Polarisation of light, Polaroids, Behaviour of light under crossed nicols with mineral section.
7 hrs

UNIT-3
7 hrs

UNIT-4
HYDROGEOLOGY

7 hrs

UNIT-5

7 hrs

UNIT-6
MINING GEOLOGY

7 hrs

Books:
2. Gemstones - Smith, H.
3. Gems - Webster, R.
4. Gems and Gem Industry in India – R.V. Karanth
5. Gemstones-Enchanting Gifts of Nature – R.V. Karanth
7. Environmental Geology & Conservation, Land use planning and Resource Management – Peter T. Flawn
8. Environmental Geography – Savindra Singh
9. Groundwater Hydorlogy - D. K. Todd
11. Groundwater - C. L. Tolman
14. Hydrology - C. W. Fetter
15. Principles of Mining Geology-Arogya Swamy.
16. Hydrology - Raghunath
17. Hydrology – Karanth
18. Indian Mineral Resources - Krishnaswamy, S and Sinha..
19. Metallic and Industrial minerals - Lamey, G.A.
20. Introduction to India's economic minerals - Sharma, N.L. and Ram. K.S.

PRACTICAL (PR VII): PETROGRAPHIC TECHNIQUES-I

Optical mineralogy:

- Petrological microscope: parts and its accessories
- Determination of the following optical properties.
- Pleochroic scheme, sign of elongation, order of interference colors.
- Extinction angles.
- Identification of the following rock forming minerals under the microscopic quartz, feldspars, micas, olivine, augite, hornblende, hypersthene, calcite, garnet.

Total 14 hours

PRACTICALS (PR VIII): PETROGRAPHIC TECHNIQUES-II AND ORE GEOLOGY

Igneous rocks: granite, syenite, diorite, gabbro, Dunite, phorphyries, pegmatite, dolerite, rhyolite, trachyte, basalt.
Sedimentary rocks: sandstone, arkose, limestone (oolitic)
Metamorphic rocks: quartzite, schist, gneiss, marble, charnockitic granulites and basic granulite.

Study and identification of the following economic minerals based on physical properties:

- Native copper, graphite, sulphur, chalcopyrite, azurite and malachite, realgar and orpiment, cinnabar, cassiterite, stinnite, Galena, Sphalerite, pyrite, hematite, magnetite, limonite, pyrolusite and psilomelane, bauxite illiminite, wolframite, chromite.
- Fossil fuels: coal and its varieties.

Total 14 hrs

10 marks is allotted for field work and report

Brief note on taking geologic notes in the field. Collection of samples, numbering and marking specimens. Use of compass and clinometers in the field and determination of strike and dip of rocks. Use of topographic maps and geologic maps. Selecting and preparing a base map. Plotting geologic features on a base map. Locating field data on a base map. Mapping by the outcrop or exposure method preparing geological reports.

FIELD WORK: Field work for minimum of three days accompanied by staff members should
be arranged during sixth semester. Submission of field report by students is compulsory. The actual TA/DA for accompanying staff members should be borne by the college from E.C. funds or other heads.
Question paper pattern

CODE

I/II/III/IV SEMESTER B.Sc., DEGREE EXAMINATION
GEOLOGY

Paper-I: TITLE

Time: 3 hours
marks: 60

max

INSTRUCTIONS TO CANDIDATES

1. Answer all question
2. Draw labeled diagrams wherever necessary.

I. Simple answer question:
Answer the following in a word or a phrase or a sentence
7X1=7 marks
1.
2.
3.
4.
5.
6.
7.

II. Short answer question:
Answer any FIVE of the following
5X3=15 marks
8.
9.
10.
11.
12.
13.
14.

III. Medium answers questions:
Answer any THREE of the following
3X6=18 marks
15.
16.
17.
18.
19.

IV. Long answer questions:
Answer any TWO of the following:
2X10=20 marks
20.
21.
22. Explain
   a).
   b).
Question paper pattern

CODE: V/VI SEMESTER B.Sc., DEGREE EXAMINATION GEOLOGY

Time: 3 hours

INSTRUCTIONS TO CANDIDATES

1. Answer all questions
2. Draw labeled diagrams wherever necessary.

I. Simple answer question:
Answer the following in a word or a phrase or a sentence
7X1=7 marks
1. 
2. 
3. 
4. 
5. 
6. 
7. 

II. Short answer question:
Answer any SIX of the following
6X3=18 marks
8. 
9. 
10. 
11. 
12. 
13. 
14. 
15. 

III. Medium answers questions:
Answer any FIVE of the following
5X5=25 marks
16. 
17. 
18. 
19. 
20. 
21. 
22. 

IV. Long answer questions:
Answer any THREE of the following
3X10=30 marks
23. 
24. 
25. 
26. Explain
   a). 
   b).