CLUSTER UNIVERSITY SRINAGAR

SYLLABUS – SEMESTER 4th (CBCS) – B.Sc. GEOLOGY

(CORE COURSE - THEORY)

(Lectures-60)

TITLE: Paleontology, Stratigraphy and Fuel Geology

Course Code: GL-T4 **CREDITS: 04**(Total: 60 Marks)

PALEONTOLOGY

Unit-I (Lectures-18)

1.1.Paleontology and its applications

1.2.Origin and evolution of the life through ages;

1.3.Geological time scale and evolution of life

1.4. Preliminary idea about faunal succession.

1.5.Fossils: Definition, their characters, conditions necessary for fossilization; types ofpreservation and occurrence.

1.6.Morphology, geological and geographical distribution of the following: (1) Brachiopoda, (2) Bivalvia, (3) Gastropoda, (4) Cephalopoda, (5) Graptoloida, (6) Anthozoa, (7) Echinoidea and (8) Trilobita

Unit-2 (Lectures-18)

2.1. Elementary ideas about Foraminifera, Ostracoda, Radiolarian and Conodonts.

2.2. Elementary concept of vertebrate Paleontology with special reference to Siwaliks.

2.3 Evolution of Man, Horse and Elephant

2.4. Introduction to micropaleontology and microfossils and their applications.

2.5 Introduction to Palaeobotany with special reference to Gondwana plant fossils.

2.6 Extinction of organisms with special reference to different hypothesis for the extinction of dinosaurs

2.7 Introduction to Palynology and its applications.

2.8. Application of Paleontological data inpaleogeographic reconstructions.

2.9. Paleontological evidence in favor of continental drift.

STRATIGRAPHY

Unit-3 (Lectures-18)

3.1. Stratigraphy: Introduction, nomenclature and Principles.

3.2. Stratigraphic correlation; imperfection of geological record.

3.3. Brief introduction to Precambrian rocks of India with special reference to their classification, distribution, lithology and economic importance: Dharwar, Aravalli, Cuddapah and Vindhyan

3.4. Stratigraphy of the following Phanerozoic rocks with special reference to their lithology and fossil content: Paleozoic succession of Kashmir, Triassic of Spiti, Jurassic of Kuch, Cretaceous of Tiruchirapalli.

3.5. Stratigraphy of Siwaliks and Karewas of Kashmir.

FUEL GEOLOGY

Unit-4(Lectures-18)

4.1. Origin of Petroleum: Organic versus inorganic theories, transformation of organic matter into petroleum (geochemical aspects, pressure, temperature, depth of occurrence).

4.2. Limiting conditions of petroleum occurrence.
4.3. Reservoir rocks – definition and types.
4.4. Source rocks; definition and types.
4.5. Migration and accumulation of petroleum: primary and secondary migration.
4.6. Reservoir Traps: Definition and classification (structural and stratigraphic)
4.7. Cap rocks: Definition and types.
4.8. Coal: Origin of coal
4.9. Constituents of coal, Rank and grade of coal
4.10. Varieties of coal and their physical and chemical characters
4.11. Distribution of Coal in time and space.

Books Recommended:

1. Wadia, D., 1973. Geology of India. McGraw Hill Book co.
2. Krishnan, M.S., 1982. Geology of India and Burma, 6th Edition. CBS Publ.
3. Ravindra Kumar, 1985. Fundamentals of Historical Geology & Stratigraphy of India. Wiley Eastern.
4. Shrock, R.R. &Twenhoffel, W.H., 1952. Principles of Invertebrate Paleontology. CBS Publ.
5. Swinerton, HH., 1961. Outlines of Paleontology. Edward Arnold Publishers
6. Jain, P.C. &Anantharaman, M.S., 1983. Paleontology: Evolution & Animal Distribution. Vishal Publ.
7. Lehmann, U., 1983. Fossil Invertebrate. Cambridge Univ. Press.
8. Rastogi, 1988. Organic evolution. Kedrnath and Ramnath Publ.
9. Chandra D. (2007). Chandra's Textbook on applied coal petrology. Jijnasa Publishing House.
10. Shelly R. C. (2014). Elements of Petroleum geology: Third Edition, Academic Press
11. Bjorlykke, K. (1989). Sedimentology and petroleum geology. Springer-Verlag.
12. Bastia, R., &Radhakrishna, M. (2012). Basin evolution and petroleum prospectivity of the continental margins of India (Vol. 59). Newnes.
13. Levorsen, A. I. (2006). Geology of Petroleum. CBS Publisher.

CLUSTER UNIVERSITY SRINAGAR
SYLLABUS – SEMESTER 4th (CBCS) – B.Sc. GEOLOGY
(CORE COURSE - PRACTICAL)

TITLE: PRACTICAL

Course Code: GL-P4 **CREDITS: 02** (Total: 30 Marks)

A. Study of morphological characters of the following selected genera:
(i) Brachiopoda (ii) Bivalvia (iii) Gastropoda (iv) Cephalopoda
(v) Trilobita (vi) Echinoidea (vii) Graptoloidea (viii) Anthozoa.

B: One day field trip to nearby areas containing fossiliferous rock formations. The objective of the field trip must be identification and collection of fossils.

CLUSTER UNIVERSITY SRINAGAR
SYLLABUS – SEMESTER 4th (CBCS) – B.Sc. GEOLOGY
(SKILL ENHANCEMENT COURSE)
Geology &Mineral Resources of Jammu and Kashmir

TITLE: PRACTICAL

Course Code: GL-SEC4 **CREDITS: 04**(Total: 60Marks)

Section-A (2-CREDITS)(Lectures-30)

1.1. Geological profile of J&K State

1.2. Tectonic framework of J&K State.

1.3. Overview of mining activity in J&K State.

1.4. Role of minerals in mineral based industrialization and developmental works in J&K state.

1.5. Mineral Regulations in J&K State: i) Jammu and Kashmir Minor Mineral Concession, Storage, Transportation and Prevention of Illegal Mining Rules 2016, ii) Jammu and Kashmir District Mineral Foundation (Composition, Contribution, Functioning, Funding & Trust) Rules 2017, iii) Jammu and Kashmir Minor Mineral Exploitation and Processing Rules 2017.

Section-B (1-CREDIT)(Lectures-15)

Occurrences, Distribution, Economic potential of following mineral resources: Limestone, Gypsum, Marble, Granite, Bauxite, Coal, Lignite, Magnesite, Slates, Sapphire, Quartzite, Borax, Dolomite, China clay, Graphite, Brick earth, clay, sand, masonry stones, nallaBajri, nalla boulder, nalla muck, Phandai stones.

Field Work (1-CREDIT) (Lectures-15)

One week field work to visit different mining sites of J & K State. The objective of the field trip is to get familiar with the mining activities, economic potential and contribution of different minerals to the state economy.

Suggested Readings

1. Krishnnaswamy, S., 1979. India's Minerals Resources. Oxford and IBH Publ.
2. Sharma, N.L. and Ram, K.V.S., 1972. Introduction to India's Economic Minerals, Dhanbad.
3. Umeshwar Prasad, 2003. Economic Geology.CBS Publishers and distributers.
4. Wadia, D., 1973. Geology of India. McGraw Hill Book co.
5. Krishnan, M.S., 1982. Geology of India and Burma, 6th Edition. CBS Publ.
6. Ravindra Kumar, 1985. Fundamentals of Historical Geology & Stratigraphy of India. Wiley Eastern.
7. www.geominjk.nic.in; www.jkminerals.com;