

**Syllabus and course structure for B.Sc. Geology for Leh Campus
Effective from academic session 2015 and onwards**

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2nd Semester

Course Code: GEO

Course Name: B.Sc Geology

Theory

Geology: GL-2

Igneous Petrology

Nature and scope of petrology: Difference between Petrography and petrogenesis.

Texture and structure of igneous rocks: Large structures- blocky lava, amygdaloidal lava, and vesicular structures, pillow structures, flow structures, sheet and platy structures, prismatic and columnar structures. Crystallinity, granularity (phaneric and aphanitic), shapes of crystals, mutual relations of crystals, equigranular and unequigranular textures, porphyritic, poikilitic, ophitic, intersertal and intergranular textures, directive textures, intergrowth textures. Reaction textures. Reaction structures ó corona and kelyphitic borders.

Classification of igneous rocks: Principles of classification, CIPW classifications, IUGS classification and tabular classification. Nomenclature and description of common igneous rocks. Composition and constitution of magma: Definition of magma, composition of magma, types of magma, physico-chemical constitution of magma, primary magma.

Processes resulting in diversity in igneous rocks: Fractionation and differentiation ó Gravity settling, filter-press differentiation, flow diffusion and gaseous transfer within magma; liquid immiscibility, mixing of magmas. Assimilation.

Metamorphic Petrology

Metamorphic rocks: Definition of metamorphism; Controls of metamorphism ó bulk composition and motivating forces in metamorphism- heat, pressure and chemically active fluids. Types of metamorphism ó Contact, cataclastic, regional. Metasomatism, anataxis, palingenesis, migmatization.

Geomorphology

Fundamental concepts. Catastrophism, uniformitarianism, cycle of erosion, and base level of erosion.

Weathering: definition and types, agents of weathering. Products of weathering.

Mass wasting: Definition, types, and factors affecting mass wasting-lithology, stratigraphy, structure, topography, climate, vegetation. Epeirogenesis and orogenesis.

Oceans: Topography of sea floor. ó Continental shelves, slope, abyssal plains, Ocean ridges and, submarine valleys, canyons, deep-sea trenches and guyots.

Oceanic erosion and deposition. Coral reefs: types fringing, barrier and atolls.

Volcanoes: types, distribution and eruptional features.

Glaciers: Definition and types, snowline, glacial movements and crevasses.

Geological work of glaciers: Erosion and deposition.

Aeolian processes: erosional and depositional features.

Geological work of river; erosional and depositional features. Drainage patterns

Karst topography: Surface and sub-surface features

Structural landforms: Definition and types, Inversion of topography.

Climate and landforms: humid, sub-humid, arid, semi-arid.

Soils: Soil formation, Soil profiles, Soil types of India.

Practical: GLP-2

Igneous & Metamorphic Petrology

Study in hand specimen and under microscope of the mineral composition, textures and structures of important igneous and metamorphic rocks as included in theory paper.

Suggested Readings:

Best, M. G., 1986: Igneous Petrology, CBS Pub.

Bose, M. K., 1997: Igneous Petrology. World Press.

Ehlers and Blatt, 1999: Petrology, (Igneous, Sedimentary and Metamorphic). CBS Pub.

Miyashiro, A., 1994: Metamorphic Petrology. UCL Press Ltd., London.

McBirney, A. R., 1993: Igneous Petrology. John Wiley.

Turner & Verhoogen, 1999: Igneous and Metamorphic Petrology. CBS Pub.

Tyrrell, G. W., 1987: Principles of Petrology. CBS Pub

Winter, J.D. 2010. Igneous and Metamorphic Petrology.

Yardley, B. W., 1989: An Introduction to Metamorphic Petrology. Longman, New York.