B.Sc. (CBCS) Geology - I Year
Semester - II : Theory Paper - II
Mineralogy and Optical Mineralogy

(4 hrs/week) **Credits-4**
(60 hours)

Credit-1-Mineralogy
Definition of mineral – classification of minerals into rock forming and ore minerals. Physical properties of minerals – colour, streak, play of colours, opalescence, asterism, transparency, lustre, luminescence, specific gravity, magnetic properties, Electrical properties, pyro and piezo electricity.
Chemical properties of minerals – Isomorphism, solid solution, polymorphism, allotrophy, pseudomorphism, radioactivity; silicate structures.
Modes of Formation of Minerals: Occurrence and association of Minerals.

Credit-2-Descriptive Mineralogy
Study of physical properties, chemical properties and mode of occurrence of the following mineral groups.

Nesosilicate	Olivine, Garnet, Aluminum silicates
Sorosilicate	Epidote
Cyclosilicate	Beryl

Credit-3-Descriptive Mineralogy
Study of physical properties, chemical properties and mode of occurrence of the following mineral groups.

Inosilicate	Pyroxene: Amphibole
Phyllosilicate	Mica, Hydrous magnesium silicate
Tectosilicate	Feldspars, Feldspathoids and Silica group

Miscellaneous: Staurolite, Tourmaline, zircon, Calcite, Corundum, Apatite.

Credit-4-Optical Mineralogy
Petrological microscope (polarizing) its mechanical and optical parts.
Double Refraction, Refractive Index, Construction of Nicol Prism.
Behavior of isotropic and anisotropic minerals between crossed nicols – extinction, pleochroism, interference colours. Definition of Uniaxial and Biaxial minerals.

Credit-5- Practicals – Mineralogy- Optical Mineralogy: **45 hrs (Credits:1)**
(3 hrs/week)

1.Study of physical properties and diagnostic features of the following minerals.
Quartz, Jasper, Agate, Chalcedony, Amethyst, Flint, Chert, Orthoclase, Microcline, Plagioclase, Labradorite, Augite, Hornblende, Tremolite, Asbestos, Muscovite, Biotite, Phlogopite, Olivine, Epidote, Garnet, Kyanite, Sillimanite, Andalusite, Beryl, Zircon, Apatite, Corundum, Talc, Gypsum, Calcite, Serpentine.
2. Study of optical properties of the following minerals: Quartz, Orthoclase, Microcline, Plagioclase , Augite, Hornblende, Hypersthene, Muscovite, Biotite, Garnet, Olivine, Kyanite, Silliminite, Leucite, Calcite.

Text Books:

1. Rutleys Elements of Mineralogy - H.H.Reed.
2. Manual of mineralogy – C. S.Hurlbut and C.Klein.
3. Mineralogy for students - M.H.Batey.
4. A text book of Mineralogy- E. S. Dana and W. E. Ford

References Books:

1. An introduction to rock forming minerals - Deer, Howie, and zussman.
2. Elements of mineralogy - Mason and Berry.
3. Optical Crytstallography - Wahlstorm.
4. Elements of optical mineralogy; an introduction to microscopic petrography by Winchell, N. H. and A.N.Wichell (Newton Horace), Part-1.
5. Manual of optical mineralogy - Shelley.