

<b>Semester</b> : First		<b>Course</b> : Core				<b>Course Code</b> : C-2			
<b>Title</b> : Mineralogy									
Credit	Theory (4 Credit) Marks				Practical (2 Credit) Marks				Total Marks
	End Semester Exam	Internal Assessment	Exam Duration in Hours	Total	End Semester Exam	Internal Assessment	Exam Duration in Hours	Total	
<b>6</b>	50	20	2½	<b>70</b>	20	10	3	<b>30</b>	<b>100</b>

Objectives: This paper enables learners to identify crystals and minerals. Learners will acquire descriptive knowledge on physical and optical properties of the minerals. Learners will know about different groups of rock forming minerals.

### THEORY

Units	Topics	Class	Marks
Unit 1: Crystallography	Introduction to crystallography, crystalline and non-crystalline matter, geometrical nature of crystal. Morphology of crystals; face, edge and solid angle. Laws of constancy of interfacial angles, axial systems and axial ratio. Crystal symmetry operations, direction and planes in crystal structures. Point group and space group symmetry. International system of symmetry notations. Classification of crystals into systems and classes. Crystal growth and twinning, different types of crystal twins.	12	10
Unit 2: Descriptive Mineralogy	Introduction to mineralogy: composition of common rock-forming minerals, silicate and non-silicate structures; CCP and HCP structures. Significance of atomic structure in physical properties of minerals, Physical properties of minerals: colour, luster, streak, density, specific gravity and hardness. Moh's hardness Scale Cleavage, parting and fracture, Form and habit of minerals. General Idea about - Tectosilicates, Phyllosilicates, Inosilicates, Cyclosilicates, Sorosilicates and Orthosilicates; Non- Silicates: Native elements, Sulfides, Oxides, Halides, Sulfate and Phosphate families. Physical and optical characters of : 1) Quartz 2) Feldspar 3) Mica 4) Amphibole 5) Pyroxene 6) Olivine 7) Garnet 8) Chlorite 9) Calcite 10) Feldspathoids.	36	25
Unit 3: Optical Mineralogy	Natural light, ordinary and polarized light, polarization of light and polaroids, refractive index and relief, becke line and its use, double refraction, birefringence, behavior of isotropic and anisotropic mineral, pleochroism and pleochroic scheme, interference colour, extinction, polarizing microscope, interference figure, optic sign and determination of optic sign.	16	15

### PRACTICALS (C-2 Lab)

Sl.	Exercise	Class	Marks
1	Study of Symmetry elements of crystal models	4	2
2	Stereographic projections of crystal models	8	4
3	Identification and study of physical properties of Minerals	10	5
4	Optical identification and study of minerals	10	5
5	Note Book		2
6	Viva Voce		2

### IMPORTANT READINGS

- Perkins, D. (2015). Mineralogy. Pearson Education India.
- Klein, C., Dutrow, B., Dwight, J., & Klein, C. (2007). The 23rd Edition of the Manual of Mineral Science (after James D. Dana). J. Wiley & Sons.
- Deer, W. A., Howie, R. A., & Zussman, J. (1992). An introduction to the rock-forming minerals (Vol. 696). London: Longman.
- Gribble, C. D. (2005). Rutley's Elements of Mineralogy. CBS.
- Mason & Berry (2004). Mineralogy. CBS.
- Rabindra, H. N. (2012). Practical Approach to Crystallography and Mineralogy. CBS.
- Sands, D. E. (1994). Introduction to Crystallography. Dover Publications Inc.