B. Sc. Geology **NEP Program**

First Year

Course Category	Semester-I				Semester-II			
	Subject/Title	No. of Paper	Credits		Subject/Title	No. of Paper	Credits	
			T	P			T	P
Discipline Specific Core	DSC Subject -I Physical & Structural Geology	1	2	2	DSC Subject -I Crystallography & Mineralogy	1	2	2
	DSC Subject-II	1	2	2	DSC Subject-II	1	2	2
MD/ID Subject-I	MD-I/ID-I Elementary Knowledge of Earth PART I	1	2	2	MD/ID-II Elementary Knowledge of Earth PART II	1	2	2
MD/ID* Subject-II		1	2	2	MD/ID-II		2	2
SEC	Field work/SEC/ Communication Skills **Or** AMSC/Field Work/SEC	1	2	-	AMSC/Field Work/SEC **Or** Field work/SEC/ Communication Skills	1	2	-
VAC	Understanding and Connecting with the Environment OR Life Skills & personality development	1	2	-	Understanding and Connecting with the Environment OR Life Skills & personality development	1	2	
Total		5	12	8		5	12	8

*-This course will be offered by Department for whole University as "Disaster Management"

Co-ordinator- Prof. MPS Bisht; HOD

Dean
School of Earth Science
H.N.B. Garhwal University
(A Central University)
Srinagar (Garhwal)-246174
Uttarakhand

18/09/2025

Head
Department of Geology
H.N.B. Garhwal University
Srinagar (Uttarakhand) 246174

FIRST SEMESTER – ONE (Ist)

DSC-Subject-I **PHYSICAL AND STRUCTURAL GEOLOGY**

THEORY

(02 CREDITS) (70 + 30)

Unit I: Introduction to geology and its scope, Origin, shape, size, mass density, and its atmosphere; a brief account of various theories regarding the origin and age of the earth, brief ideas of the interior of the earth and its composition

Unit II: Physical and Natural Agents of Weathering and Erosion, factors, types, and their effects. Earthquakes: nature of seismic waves and their intensity, causes of earthquakes; Volcanoes: types, products, causes, and distribution.

Unit III: Introduction to Structural Geology; contours, topographic and geological maps, Elementary idea of dip and strike, true and apparent dip, outcrops, and effects of different structures on outcrop

Unit IV: Folds, Faults, and Joints and Unconformities: Nomenclature and Their Classification. Fault: terminology and classification

PRACTICAL

(02 CREDITS) (70 + 30)

Physical Geology: Study of topographic maps, identification of geomorphic features/models

(20 Marks)

Structural geology: Learning use of Clinometers/Brunton compass, Exercises on structural problems, preparation of cross-sectional profiles

(20Marks)

Practical records:

(15 Marks)

Viva – voice:

(15 Marks)

MD/ID Subject I **ELEMENTARY KNOWLEDGE OF EARTH SCIENCES PART I**

(02 CREDITS) (70+30)

Unit I: Introduction to Geology and its scope, Earth and Solar System, Big Bang Theory

Unit II: Brief idea of interior of the earth and its composition Elementary ideas of Weathering and Erosion Earthquake and volcano their causes and distribution.

Unit III: Contours, topographic maps, elementary idea of dip and strikes, outcrops. Brief idea of folds, and their geometrical classification.

Unit IV: Elementary idea of faulting and Brief account of joints and unconformities.

Head
Department of Geology
H.N.B. Garhwal University
Srinagar (Uttarakhand) 246174

PRACTICAL **(02 CREDITS) (70+30)**

Physical Geology: Study of topographic maps; Identification of geomorphic features; models **(25 Marks)**

Structural Geology: Learning use of clinometers/Brunton compass, Preparation of cross-sections profiles. **(25 Marks)**

Practical Records **(10 Marks)**

Viva – voice **(10 Marks)**

SEC COURSE **GEOLOGICAL FIELD TRAINING** **Credits :02**

Students will be required to carry out Geological Field training in an important geological terrain to study the elementary aspects of filed geology for one week and to submit a report thereon.

SEMESTER – SECOND (IInd)

DSC Subject-I CRYSTALOGRAPHY AND MINERALOGY

THEORY **(02 CREDITS) (70 + 30)**

Unit I: Crystal: Definition and external morphology

Unit II: Interfacial angles and their measurements, Parameters in crystals, Weiss and Miller system of notations.

Unit III: Symmetry elements and forms of normal class of Isometric, Tetragonal, Hexagonal, Trigonal, Orthorhombic, Monoclinic and Triclinic systems

Unit IV: Introduction to Mineralogy, Definition and characters of mineral.

Unit V: Physical properties and chemical composition of minerals, diagnostic properties of the following minerals: Quartz, Orthoclase, Microcline, Hornblende, Garnet, Muscovite, Biotite, Chlorite, olivine and Calcite

Unit VI: Ordinary and polarized lights; Polarizing microscopes and its parts with functioning important optical properties observed under polarized and crossed Nicols.

Unit VII: Optical properties of following rock forming minerals: Quartz,, Orthoclase, Microcline, olivine, Garnet, Augite, Hypersthene, Hornblende, Biotite, Calcite and Zircon.

PRACTICAL **(02 CREDITS) (70 + 30)**

Crystallography: Study of symmetry elements of normal class of Isometric, Tetragonal, Hexagonal, Trigonal, Orthorhombic, Monoclinic and Triclinic systems **(25 Marks)**

Dean
School of Earth Science
H.N.B. Garhwal University
(A Central University)
Srinagar (Garhwal)-246174
Uttarakhand

Head
Department of Geology
H.N.B. Garhwal University
Srinagar (Uttarakhand) 246174

Mineralogy: Study of physical properties of minerals mentioned in theory course, Use of polarizing microscope, Study of optical properties of common rock forming minerals mentioned in theory course

(25 Marks)

Practical records: **(10 Marks)**

Viva – voice: **(10 Marks)**

MD/ID Subject I ELEMENTARY KNOWLEDGE OF EARTH SCIENCES PART II

THEORY **(02 CREDITS) (70 + 30)**

Unit I: Crystal form, face, edge, solid angle, Interfacial angle and their measurements

Unit II: Miller system of notations, Symmetry elements and description of normal class of Isometric, tetragonal, Hexagonal, Trigonal, Orthorhombic, Monoclinic and Triclinic systems.

Unit III: Introduction to Mineralogy and its importance, Common physical properties of minerals such as Quartz, Orthoclase, Hornblende, Garnet, Muscovite, Biotite, Olivine and Calcite.

Unit IV: Polarizing microscope, its parts and functioning, Optical properties of some common rock forming minerals: Quartz, Orthoclase, Olivine, Augite, Hypersthene, Hornblende, Biotite, Calcite.

PRACTICAL **(02 CREDITS) (70 + 30)**

Crystallography: Study of symmetry elements of normal class of Isometric, Tetragonal, Hexagonal, Trigonal, Orthorhombic, Monoclinic and Triclinic systems **(25 Marks)**

Mineralogy: Study of physical properties of minerals mentioned in theory course, Use of polarizing microscope, study of physical properties of minerals mentioned in theory course, Use of Polarizing Microscope **(25 Marks)**

Practical records: **(10 Marks)**

Viva – voice: **(10 Mark**

SEC COURSE **GEOLOGICAL FIELD TRAINING** **Credits :02**

Students will be required to carry out Geological Field training in an important geological terrain to study the elementary aspects of filed geology for one week and to submit a report thereon.

Dean
School of Earth Science
H.N.B. Garhwal University
(A Central University)
Srinagar (Garhwal)-246174
Uttarakhand

Head
Department of Geology
H.N.B. Garhwal University
Srinagar (Uttarakhand) 246174