

**SYLLABI AND COURSES OF STUDY IN GEOLOGY**  
Examinations to be held in December 2016, 2017 and 2018)

**Syllabi for B. Sc. CBCS pattern Semester – I**

**Course No. UGETC101**

**Credits: 04**

**Time: 03 hours**

**Title: Physical and Structural Geology**

**Maximum Marks: 100**

**External Examination: 80 Marks**

**Internal Assessment: 20 Marks**

**UNIT-1**

- 1.1 Definition of Geology, its relationship with other sciences, Branches of geology, Aim and Application of Geology. Earth as a planet- its shape, size, mass, density and atmosphere.
- 1.2 Origin of Earth: Kant-Laplace, Jeans and Jeffrey's, Big Bang Theories.
- 1.3 Geochronology and its application in Geology, Radioactive dating Methods: K-Ar, C-14 and U-Pb methods.
- 1.4 Interior of earth and its composition, nature of seismic waves and their application in the study of interior of earth.
- 1.5 Definitions of Erosion and Denudation, types and prevention of soil erosion.

**UNIT- 2**

- 2.1 Earthquakes; Causes, magnitude and intensity. Seismic zones of India, earthquake prediction.
- 2.2 Volcanoes: Classification of volcanoes, volcanic landforms and distribution of volcanoes
- 2.3 Weathering: Controlling factors of weathering, Types of weathering.
- 2.4 Karst topography: Erosional and depositional features of Karst topography.
- 2.5 Earth movements: Exogenic and endogenic movements

**UNIT-3**

- 3.1 Fluvial Process: River profile, Stream types, Drainage pattern, erosional and depositional features produced by river.
- 3.2 Aeolian process: Processes of Aeolian erosion, erosional and depositional features produced by wind.
- 3.3 Glaciers: Their types, erosional and depositional features produced by glaciers, glaciations through geological ages.
- 3.4 Unconformities: Formation, types and their recognition in the field.
- 3.5 Identification of bedding plane, Geological uses of Clinometers, Brinton Compass.

**UNIT-4**

- 4.1 Joints; Definitions; Genesis; Classification and Significance.
- 4.2 Lineation: Definition; Types; Origin and its relationship with major structures.
- 4.3 Mechanics of faulting, distinguishing of faults from unconformities.
- 4.4 Vertical and horizontal tectonics: Origin of grabbens, horsts, window, klippe & nappes.
- 4.5 Mechanical aspects of folding.

**UNIT-5**

- 5.1 Recognition of the folds in the field
- 5.2 Boundin structures: geometry and types.
- 5.3 Equal area and stereographic projections, plotting of structural data.
- 5.4 Relationship between folds and foliations.
- 5.5 Response of rocks to stress change: elastic, plastic and brittle behavior of the rocks.

### Books recommended

- |                           |                                 |
|---------------------------|---------------------------------|
| 1. A. Holmes              | -Principles of Physical Geology |
| 2. Thornburry             | -Geomorphology                  |
| 3. Deer, Hawie & Zuessman | -Rock forming minerals          |
| 4. Bagley, P.C            | -Structure and Tectonics        |
| 5. Gosh, S.K              | -Structural Geology             |
| 6. A.M.Pat Wardhan:       | The Dynamics of Earth System    |
| 7. Valdiya K.S.:          | Dynamic Himalaya                |
| 8. M.P.Billings:          | Structural Geology              |

### **Note for paper setting:**

**Internal Assessment Test** shall consist of one long answer type question of 10 marks and five short answer type questions of 2 marks each to be conducted after the completion of 50% of the syllabus from unit 1.1 to 3.2 (after 45 days) of 1 hour duration with 20% weightage (20 marks).

**Semester End Examination:** 03 hours duration of 80 marks to be conducted after completion of 100% of syllabus will consist of section A, B and C

05 short Answer Questions of 04 marks each total 20 marks to be set from **all 5 units**.

03 Medium Answer Questions of 10 marks each to be set from **units 3.3 to 5.5** with internal choice 30 marks

02 Long Answer Questions to be set from **unit 4 and 5** only with internal choice 30 marks.

## **SYLLABI AND COURSES OF STUDY IN GEOLOGY**

Examinations to be held in December 2016, 2017 and 2018)

### **Syllabi for B. Sc. CBCS pattern Semester – I**

**Course No. UGEPC102**

**Credits: 02**

**Time: 04 hours**

**Title: Practical**

**Maximum Marks: 50**

**External Examination: 25 Marks**

**Internal Assessment: 25 Marks**

### **Practicals**

The practical component shall be of 50 marks (**internal**) comprising of continuous class assessment, practical test and attendance. The breakup of the marks shall be as follows: 10 marks as continuous class assessment in the practicals, 10 marks written examination (four hours duration) at the end of the semester, and 5 marks for practical attendance (to be allotted as per statutes) **external examination** 15 marks for test, 5 marks for attendance and 5 marks Viva-voce

1. Determination of apparent dip from true dip
2. Determination of true dip from apparent dip
3. Drawing of geological sections, writing of geological history and completion of outcrops in the given geological maps.

# SYLLABI AND COURSES OF STUDY IN GEOLOGY

Examinations to be held in May 2017, 2018 and 2019)

## Syllabi for B. Sc. CBCS pattern Semester – II

**Course No. UGETC201**

**Credits: 04**

**Time: 03 hours**

**Title: Crystallography and Mineralogy**

**Maximum Marks: 100**

**External Examination: 80 Marks**

**Internal Assessment: 20 Marks**

### UNIT-1

- 1.1 Crystal structure, morphology of crystals, division of different crystals into six crystal systems.
- 1.2 Crystallographic axes and axial angles, notation of faces on parameters of Weiss and Miller indices.
- 1.3 Symmetry elements
- 1.4 Crystal Symmetry and forms of Normal classes of Cubic, Tetragonal and Hexagonal Systems.
- 1.5 Crystal Symmetry and forms of Normal classes of Orthorhombic, Monoclinic and Triclinic systems.

### UNIT-2

- 2.1 Definition of a mineral- classification of minerals into rock forming and ore forming minerals.
- 2.2 Twinning: Twin crystals, Twin axis, twin planes, composition planes, Twin Laws and different types of twinning.
- 2.3 Physical properties of minerals and their significance in the identification of the minerals. Moh's scale of hardness.
- 2.4 Silicate Minerals: definition and their classification based on silicate structure.
- 2.5 Silicate Structures: Isomorphism, Polymorphism, Allotropy and Pseudomorphism.

### UNIT-3

- 3.1 Feldspars: Physical properties, chemical composition and classification.
- 3.2 Micas: Physical properties, chemical composition and crystal system.
- 3.3 Amphibole Group: Physical properties, chemical composition and crystal system.
- 3.4 Pyroxene Group: Physical properties, chemical composition and crystal system.
- 3.5 Garnet Group: Physical properties, chemical composition and crystal system.

### UNIT-4

- 4.1 Olivine and Epidote Groups: Physical properties, chemical composition
- 4.2 Physical properties and chemical composition: Quartz, Calcite, Aragonite, Chlorite, Andalusite, Sillimanite, Kyanite, Cordierite, Spinel, Topaz and Zircon.
- 4.3 Petrological microscope: construction and working.
- 4.4 Ordinary and Polarized light, methods to obtain polarized light.
- 4.5 Pleochroism and Birefringence: Pleochroic halos, dichroism and trichroism.

## UNIT-5

- 5.1 Extinction: Definition, types and extinction angle.
- 5.2 Reflection, Refraction, Isomorphism and anisotropism.
- 5.3 Double refraction, Nicol prism- its construction and working.
- 5.4 Refractive index: methods of its determination, critical angle.
- 5.5 Interference colours and interference colour chart.

### Books recommended

- |                           |                                  |
|---------------------------|----------------------------------|
| 1. H.H.Reed               | -Rutley's Mineralogy             |
| 2. Tyrrel                 | -Principles of Petrology         |
| 3. Deer, Hawie & Zuessman | -Rock forming Minerals           |
| 4. Myron,G                | -Igneous & Metamorphic Petrology |
| 5. Turner                 | -Metamorphic Petrology           |
| 6. Dana, E.S              | -A text book of mineralogy       |

### **Note for paper setting:**

**Internal Assessment Test** shall consist of one long answer type question of 10 marks and five short answer type questions of 2 marks each to be conducted after the completion of 50% of the syllabus from unit 1.1 to 3.2 (after 45 days) of 1 hour duration with 20% weightage (20 marks).

**Semester End Examination:** 03 hours duration of 80 marks to be conducted after completion of 100% of syllabus will consist of section A, B and C

05 short Answer Questions of 04 marks each total 20 marks to be set from **all 5 units**.

03 Medium Answer Questions of 10 marks each to be set from **units 3.3 to 5.5** with internal choice 30 marks

02 Long Answer Questions to be set from **unit 4 and 5** only with internal choice 30 marks.

**Course No. UGEP202**

**Credits: 02**

**Time: 04 hours**

**Title: Practical**

**Maximum Marks: 50**

**External Examination: 25 Marks**

**Internal Assessment: 25 Marks**

### **Practicals**

The practical component shall be of 50 marks (**internal**) comprising of continuous class assessment, practical test and attendance. The breakup of the marks shall be as follows: 10 marks as continuous class assessment in the practicals, 10 marks written examination (four hours duration) at the end of the semester, and 5 marks for practical attendance (to be allotted as per statutes) **external examination** 15 marks for test, 5 marks for attendance and 5 marks Viva-voce

1. Study of physical properties and diagnostic features of the following minerals: Quartz, albite, microcline, orthoclase, muscovite, biotite, tourmaline, hornblende, augite, olivine, epidote, garnet, andalusite, kyanite sillimanite, beryl, apatite, corundum, talc gypsum, calcite, fluorite, actinolite, tremolite, asbestos and zircon.
2. Study of optical properties of the following minerals: Quartz, albite, microcline, orthoclase, muscovite, biotite, tourmaline, hornblende, augite, olivine, epidote, garnet
3. Study of Crystal models of Normal Classes of 6 crystal systems