B.Sc. GEOLOGY- SYLLABUS (CBCS)
2019 - 20 Onwards

### THEORETICAL CREDITS

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Paper</th>
<th>Title of the Paper</th>
<th>HPW</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>Sem I</td>
<td>Paper I</td>
<td>Physical Geology and Crystallography</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>.</td>
<td>Paper II</td>
<td>Mineralogy and Optical Mineralogy</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>Paper III</td>
<td>Igneous and Metamorphic Petrology</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Sem IV</td>
<td>Paper IV</td>
<td>Sedimentary Petrology and Structural Geology</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>Paper V</td>
<td>Indian Geology and Palaeontology</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Sem VI</td>
<td>Paper VI</td>
<td>Discipline specific Elective - Optional I A - Hydrogeology or Optional I B - Mineral Exploration</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Sem VI</td>
<td>Paper VII</td>
<td>Economic Geology</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Paper VIII</td>
<td></td>
<td>Discipline specific Elective - Optional I A - Environmental Geology or Optional I B - Mining Geology</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

### PRACTICAL CREDITS

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Paper</th>
<th>Title of the Paper</th>
<th>HPW</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>Sem I</td>
<td>Paper I</td>
<td>Physical Geology and Crystallography</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>.</td>
<td>Paper II</td>
<td>Mineralogy and Optical Mineralogy</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>Paper III</td>
<td>Igneous and Metamorphic Petrology</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sem IV</td>
<td>Paper IV</td>
<td>Sedimentary Petrology and Structural Geology</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>Paper V</td>
<td>Indian Geology and Palaeontology</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sem VI</td>
<td>Paper VI</td>
<td>Discipline specific Elective - Optional I A - Hydrogeology or Optional I B - Mineral Exploration</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sem VI</td>
<td>Paper VII</td>
<td>Economic Geology</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Paper VIII</td>
<td></td>
<td>Discipline specific Elective - Optional I A - Environmental Geology or Optional I B - Mining Geology</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: A Geological field trip including open cast and Underground mine visit is recommended for the BSc. Geology final year students.
# B.Sc. GEOLOGY - SYLLABUS (CBCS)

## 2019 - 2020 Onwards

### THEORY

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Title of the Paper</th>
<th>HPW</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>Sem I</td>
<td>Physical Geology and Crystallography</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Sem II</td>
<td>Mineralogy and Optical Mineralogy</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

### PRACTICALS

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Title of the Paper</th>
<th>HPW</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>Sem I</td>
<td>Physical Geology and Crystallography</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sem II</td>
<td>Mineralogy and Optical Mineralogy</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>
B.Sc. (CBCS) Geology - I Year  
Semester - I : Theory Paper - I  
Physical Geology and Crystallography  

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

Credit-1- Physical Geology - Earth  
**Definition of Geology** – Basic assumptions of Geology – Its relationship with other sciences – Branches of Geology – Aim and Applications of Geology.  
**Earth**: Its shape, size, and density – movement and their effects. Origin and age of Earth. Interior of the earth. Geological processes – exogenic and endogenic, Definition of weathering – Types of weathering of rocks – physical and chemical; Definition of erosion and denudation, agents of erosion, cycle of erosion; erosion, transportation and deposition;  
**Earth movements**: Definition of diastrophism, epigeny and orogeny – Mountains. Continental drift and plate tectonics.  

Credit-2- Glaciers-Groundwater-Sea  
**Glaciers**: Definition of a glacier – types of glaciers – development of typical land forms by glacial erosion and deposition – Cirque, U-shaped valley, Hanging valley, Monadnocks. Moraines, Drumlín, Eskers and Varves, Characteristic features of glaciated regions.  
**Groundwater**: Storage, of ground water – porosity, permeability, aquifer, water table, zone of saturation, artesian well, spring, geysers. Development of typical land form by erosion and deposition by groundwater (Karst topography) sinkhole, cavern, stalactites and stalagmites.  
**Seas**: offshore profile – land forms of sea – marine deposits and coral reefs. Lacustrine (Lake) deposits.  

Credit-3-Rivers-Earthquakes-Volcanoes  
**Rivers**: Erosion, Transportation and deposition of river (fluvial) cycle in different stages – Development of typical land forms by river erosion and deposition. V-shaped valley. Waterfall, alluvial fans, Natural levees, Meander, Ox-bow lakes, flood plains, Peneplain and Deltas. Types of rivers.  
**Earthquakes**: Causes and kinds of earthquake waves, and mode of propagation, intensity of earthquakes, Richters scale – seismograph and seismogram. Effects of earthquakes,  
**Volcanoes**: Origin, products of Volcanoes.  

Credit-4-Crystallography  
Definition of a crystal – amorphous and crystalline states, Morphology of Crystals – face, edge, solid angle, interfacial angle.  
**Forms**: Simple, combination, closed, and open forms.  
**Symmetry**: Plane, axis, centre, crystallographic axes, Parameters, indices; crystallographic notation – parameter system of Weiss, index system of Miller.  
Classification of Crystals into 7 Systems.  
Morphological study of the following classes of symmetry.  
I. Cubic system – Normal class - Galena type  
II. Tetragonal system – Normal class - Zircon type  
III. Hexagonal system – Normal class - Beryl type  
IV. Trigonal system- Normal class - Calcite type  
V. Orthorhombic system – Normal class - Barytes type  
VI. Monoclinic system – Normal class - Gypsum type  
VII. Triclinic system – Normal class - Axinite type
Practicals:
Credit-5 – Crystallography-Geomorphology  45 hrs (Credits:1)
(3 hrs/week)

1. Study of Symmetry Elements of Seven Crystal Systems – Orientation and description of crystals from different crystal systems
2. Study of important geomorphological models and charts

Text Books:
7. Elements of Mineralogy - Rutlelys.

References:
1. Basic Physical Geology by E.S.Robinson (1982).
FACULTY OF SCIENCE  
B.Sc. (CBCS) - 1 Year Practical Examination  
GEOLOGY  
Semester-I : Paper I  
(Physical Geology and Crystallography)  

Credits : 1  
Max.Marks:25  

Time: 2½ Hours  

Practical Model Paper  

1) Identify the given crystal models 1-6 and write their crystal system, symmetry elements, forms and Miller Indices.  
   (6x2 = 12 M)  

2) Identify and add a note on the given geomorphological feature from model/chart 7-8  
   (2X4 = 8 M)  

3) Record & Viva  
   (5 M)  

..........
Credit-I-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.


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)

1. Study of physical properties and diagnostic features of the following minerals.

2. Study of optical properties of the following minerals: Quartz, Orthoclase, Microcline, Plagioclase, Augite, Hornblende, Hypersthene, Muscovite, Biotite, Garnet, Olivine, Kyanite, Sillimanite, Leucite, Calcite.
Text Books:
1. Rutleys Elements of Mineralogy - H.H.Reed.
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.
4. Elements of optical mineralogy; an introduction to microscopic petrography
FACULTY OF SCIENCE
B.Sc. (CBCS) - I Year Practical Examination
GEOLOGY
Semester-II : Paper II
(Mineralogy and Optical Mineralogy)

Time: 2½ Hours
Max.Marks:25

Credits : 1

Practical Model Paper

1) Identify the given rock forming minerals 1-7 and write their physical properties chemical composition and crystal system.  (7x2=14)
2) Write the optical properties of minerals in thin sections 6-10 under the polarizing microscope and indentify them.  (5x2=10)
3) Record & Viva  (6 M)

............

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the faculty</th>
<th>Name of the University</th>
<th>Designation</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prof.M.Srinivas</td>
<td>Osmania University</td>
<td>Head, Department of Geology</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Dr.G.Prabhakar</td>
<td>Osmania University</td>
<td>Chairperson, Board of Studies in Geology</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Prof.K.David</td>
<td>Kakatiya University</td>
<td>Head, Department of Geology</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Dr.R.Mallikarjuna Reddy</td>
<td>Kakatiya University</td>
<td>Chairperson, Board of Studies in Geology</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Prof.M.Srinivas</td>
<td>MG University</td>
<td>Chairperson, Board of Studies in Geology</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Prof.M.Srinivas</td>
<td>Telangana University</td>
<td>Chairperson, Board of Studies in Geology</td>
<td></td>
</tr>
</tbody>
</table>