Recommendations/ Report of subject expert committee on the introduction of cluster electives in Geology (VI Semester- VIII Paper) for UG BSc.

2. Lt No. APSCHE/Secy/Syllabus/2017, dated 2 November 2011 from the Secretary, AP State Council of Higher Education

Minutes of the Meeting

In pursuance of the orders of the Secretary, AP State Council of Higher Education (APSCHE) vide letter no: APSCHED/Secy/Syllabus/2017, dated 2 November 2011, the Chairman and the members of the committee on framing the cluster electives in geology for the academic year 2017-18, have met on 3rd November 2017 and 15th November 2017 in the Adikavi Nannaya University under the Chairmanship of Prof. Y. Srinivasa Rao to propose the cluster electives for Geology. Following resolutions were adopted.

1. It is resolved to propose the following Cluster electives for UG Geology in VIII Paper in Semester VI.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Cluster No</th>
<th>Title of the Paper - VIII</th>
<th>Hrs./week</th>
<th>Max. Marks</th>
<th>Mid Sem. Exa</th>
<th>Credits</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>A-2: Environmental Geology</td>
<td>3</td>
<td>75</td>
<td>25</td>
<td>3</td>
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<td></td>
<td></td>
<td>A-3: Introduction to Remote Sensing &amp; GIS</td>
<td>3</td>
<td>75</td>
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<tr>
<td>1</td>
<td>Cluster A - Lab</td>
<td>A-1 Lab: Mineral Exploration Lab</td>
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<td></td>
<td></td>
<td>A-2 Lab: Environmental Geology Lab</td>
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<tr>
<td></td>
<td></td>
<td>A-3 : Project work</td>
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<td></td>
<td>Cluster B - Theory</td>
<td>B-1: Elements of Geochemistry</td>
<td>3</td>
<td>75</td>
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<td></td>
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<td>B-2: Introduction to Mining Geology</td>
<td>3</td>
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<td>B-3: Introduction to Remote Sensing &amp; GIS</td>
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<td>Cluster B Lab</td>
<td>B-1 Lab: Geochemistry Lab</td>
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<td></td>
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<td>B-2 Lab: Field report on nearest mines</td>
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<tr>
<td></td>
<td></td>
<td>B-3: Project work</td>
<td>2</td>
<td>50</td>
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</table>

Detailed syllabi for the proposed cluster papers is enclosed herewith.
2. It is also resolved to suggest the following modifications in the syllabi from the next academic year (i.e., 2018-19) in view of the recommendations made by the UGC and also to make it convenient to the students.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Semester</th>
<th>Title of the Paper</th>
<th>Hrs./ week</th>
<th>Max. Marks</th>
<th>Mid Sem. Exam</th>
<th>Credits</th>
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<td>I - Theory</td>
<td>Paper-I- Physical Geology &amp; Crystallography</td>
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<td>I-Lab</td>
<td>Physical Geology &amp; Crystallography Lab</td>
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<td>II-Theory</td>
<td>Paper- II- Mineralogy &amp; Optical Mineralogy</td>
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<td></td>
<td>II-Lab</td>
<td>Mineralogy &amp; Optical mineralogy Lab</td>
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<td>3</td>
<td>III-Theory</td>
<td>Paper - III- Petrology (Igneous, Sedimentary and Metamorphic)</td>
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<td>III-Lab</td>
<td>Petrology (Igneous, Sedimentary and Metamorphic) Lab</td>
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<td>4</td>
<td>IV-Theory</td>
<td>Paper-IV- Structural Geology &amp; Stratigraphy</td>
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<td>IV-Lab</td>
<td>Structural Geology Lab</td>
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<td>V-Theory</td>
<td>Paper-V- Indian Geology &amp; Palaeontology</td>
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<td>V-Lab</td>
<td>Palaeontology Lab</td>
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<td>6</td>
<td>VI-Theory</td>
<td>Paper VI – Economic Geology</td>
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<td>3</td>
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<td>VI-Lab</td>
<td>Economic Geology</td>
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<td>50</td>
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<td>7</td>
<td>VII-Theory</td>
<td>Paper VII: (Elective) Hydrogeology (OR) Field Geology</td>
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<td>VII-Lab</td>
<td>Hydrogeology lab (OR) Field Geology lab</td>
<td>2</td>
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</table>

Following members attended the Meeting:

1. Prof. Y. Srinivasa Rao - Chairman
2. Sri Alluri Surendra - Member
3. Dr. M.R. Goutham - Member
4. Sri N. Srinivasa Rao - Member
UNIT - I

UNIT- II

UNIT- III

UNIT – IV

UNIT-V

Text Books:
1. Geological Prospecting & Exploration - V. M. Kneiter
3. Mining Geology - McKinnstry

Mineral Exploration – Syllabus (Practical)
1. Estimation of Ore reserves: Bedded type and vein type (Extended area and included area methods)
2. Field work in neighboring areas of geological importance: submission of dissertation/ field report. Study and interpretation of topographic maps
VIIIA-2: Environmental Geology

Unit-I

Unit-II:
Definition of soil, soil formation, soil profile, Types of soils, Classification of soils and its properties, Soil distribution in India, soil degradation and contamination. Pollution: definition, types (air, water, land,soil). Global warming, ozone depletion

Unit-III
Natural disasters: earthquake and tsunamis- Earthquake terminology, seismic zones of India, history of earthquakes & tsunamis of India and major earthquakes & tsunamis in the world. Volcanoes: volcanic hazards its effects on human beings and environment. Indian volcanoes Landslides: Types ,causes and mitigation methods.

Unit-IV
Coastal hazards: definition of coasts. waves and currents, types of coastal hazards, sediment supply and erosion. coastal zone protection and management. Introduction to coastal zones, Indian coast lines. Floods and cyclones: types, causes & mitigation.

Unit-V
Mining impact on environment and health hazards, Environmental considerations in location and construction of dams, reservoirs and tunnels. Types of wastes and its disposal with special reference to hazardous chemical wastes and radioactive waste. Oil leakages in ocean and its impact on marine life.

Practicals:
1. Grain size analysis.
2. Soil profile,
3. Identification of historical events of earthquake and tsunamis in India and world.
4. Identification of locations of volcanoes in world and India in the map.
5. Line drawings of Landslides, Types of dams

Text Books:.
1. Environmental Geology - K S Valdiya
2. Environmental Geology - Sudarshan V, Ravi C and Krishna Ch
3. Living with Earth: An introduction to Environmental Geology - Travis Hudson
4. Environmental Geology - Strainer & Strahier
5. Environmental Geology - Landgreen
6. Environmental Geology - Keller
VIIIA-3: Introduction to Remote sensing & GIS

UNIT – I

UNIT - II
Mosaics, Types of Stereoscopes, EMR Interaction with Atmosphere and Earth Surface.

UNIT - III


UNIT - V
Introduction to GIS. Data models, Main Segments of GIS, Components of GIS, GIS – Integration, GIS applications in landslide hazard zonation and environmental pollution studies

Books Recommended:

VIII A-3: Project work
Cluster - B
VIIIB-1: Elements of Geochemistry

Unit 1:
Concepts of geochemistry
Introduction to properties of elements: crystal chemistry
Chemical bonding, Geochemical classification of elements

Unit 2:
Geochemistry of solid Earth:
The Earth in relation to the solar system, Cosmic abundance of elements.
Composition of different planets.
Layered structure of Earth and their chemistry

Unit 3:
Classification of Meteorites and their chemistry, Geochemical dispersion. Distribution of major, minor and trace elements in igneous, metamorphic and sedimentary rocks.

Unit 4:
Geochemical cycle. Introduction to isotope geochemistry, Stable isotopes and unstable isotopes and its applications, Half life. Isomorphism and polymorphism

Unit 5:
Geochemistry and principles of evolution of atmosphere, hydrosphere and biosphere

SUGGESTED READINGS:

Elements of Geochemistry - (Practical)

1. Identification of rocks based on the geochemical data given.
2. Geochemical classification of water.
UNIT-I
Mining Geology: Introduction: Definition, basic concepts, terminology, broad classification of mining methods, planning, Mines & Minerals Regulation & Development Act,

UNIT-II
Exploration and exploratory mining of surface and underground mineral deposits; Geological factors considered for the selection of mining method viz.- Alluvial/Surface mining, Quarrying, Open-cast mining, and Underground mining methods;

UNIT-III
Geological conditions for- Types of openings, their position, shape and size -adits, inclines, shafts, levels, cross-cuts, winzes and raises. Types of drilling methods. Hydraulic drilling, dredging.

UNIT-IV
Opencast/open pit/pit mining – Methods – bench cut, glory hole, strip mining. Factors considered for mechanization and transportation. Advantages and disadvantages

UNIT-V
Underground mining methods: Board and pillar, room and pillar, long wall mining. Mine supports-factors considered for types of supports used. Mine ventilation- planning, its significance and effects; Drainage planning, its significance and its effect. Mining hazards: mine inundation, fire and rock burst

SUGGESTED READINGS:
1. Mining geology. Mckcnistry.
2. Mining Geology: R. N. P. Arogya Swamy

Practical: Field report on nearest mines.

VIIIB-3: Project work