Syllabus for

B. SC. APPLIED GEOLOGY

( SEMESTER PATTERN )

( For Candidates admitted in the Colleges affiliated to Periyar University from 2017 - 2018 onwards )
REGULATIONS

1. ELIGIBILITY

Candidates for admission to the first year of the Degree of Bachelor of science under Branch. VII - Applied Geology course are required to have passed the Higher Secondary Examination (Academic Stream) conducted by the Government of Tamil Nadu or an examination as equivalent to 10+2 courses including CBSE, which have been recognized by the Periyar University.

The candidates for admission to the Branch VII - Applied Geology shall have passed the qualifying Examination with the subjects under any one of the following groups.

Group - I (Maths, Physics, Chemistry and Computer Science) Group - II (Maths, Physics, Chemistry and Biology)

Group - III (Physics, Chemistry, Zoology and Botany)

For admission of students in the Government/Aided/ Unaided Colleges of Arts and Science, guidelines issued by the Director of Collegiate Education, Chennai - 6 may be followed.

2. DURATION OF THE COURSE

The course for the degree of Bachelor of Science shall consist of three years divided into six semesters with internal assessment under choice based credit system.

3. COURSE OF STUDY

The Course of study shall comprise instruction in the following subjects according to the syllabus and books prescribed from time to time.

I. SEMESTER
1. Language -I (Tamil etc)
2. English -I
3. Core -I Physical Geology and Geodynamics
4. Allied Chemistry Paper -I (or) Allied Maths -I
5. Skill Based Elective Courses-I
6. Value education

II. SEMESTER
7. Language -II (Tamil etc)
8. English -II
9. Core -II Geomorphology and Structural Geology
10. Core Practical -I* Structural Geology and Surveying
B Sc APPLIED GEOLOGY

11. Allied Chemistry -II (or) Allied Maths -II
12. Allied Chemistry Practical -I* or Allied Maths-III
13. Skill based Elective Course -II
14. Environmental Studies

III. SEMESTER
15. Language -III (Tamil etc)
16. English -III
17. Core Geology -III Palaeontology
18. Allied Physics -I
19. Skill based Elective Course -III
20. Non-Major Elective Course -I

IV. SEMESTER
21. Language -IV (Tamil etc)
22. English -IV2
23. Core Geology-IV Stratigraphy
24. Core Geology Practical Paper-III Palaeontology and Stratigraphy
25. Allied Physics -II
26. Allied Physics Practical -I*
27. Skill based Elective Course -IV
28. Non-Major Elective Course -II

V. SEMESTER
29. Core Geology - V Crystallography
30. Core Geology -VI Mineralogy
31. Core Geology -VII Igneous Petrology
32. Core Geology -VIII Sedimentary and Metamorphic Petrology
33. Skill based Elective Course -V
34. Skill based Elective Course -VI
35. Non-Major Elective Course -III
VI. SEMESTER

36. Core Geology - IX Economic Geology
37. Core Geology - X Photogeology and Remote Sensing
38. Core Geology - XI Mining and Engineering Geology
39. Core Geology - XII Hydrogeology and Environmental Geology
40. Core Geology Practical - III* Crystallography and Mineralogy
41. Core Geology Practical - IV* Economic Geology and Petrology
42. Skill based Elective Course - VII

List of Skill Based Elective Courses

I. Principles of Surveying
II. Remote Sensing and GIS
III. Cartography
IV. Field Hydrogeology and Techniques
V. Geostatistics and Computer Applications
VI. Gemology and Gemstone Evaluation
VII. Granite exploration and exploitation
VIII. Mines and Minerals Legislation of India
IX. Introduction to Geoinstrumentation
X. Water Quality Analysis
XI. Mapping Techniques in Geology
XII. Geology for competitive examination.

List of Non-Major Elective Courses

I. Oceanography
II. Climatology
III. Basic Geochemistry
IV. Basic Geophysics
V. Geohazards
VI. Groundwater Management and Rain Water Harvesting
List of Compulsory Courses
1. Value Education
2. Environmental Studies
3. Extension Activities (NSS, NCC, YRC, RRC, Green Club,)

4. Examinations:
   The theory examination shall be three hours duration to each paper at the end of each semester. The candidates failing in any subject(s) will be permitted to appear for each failed subject(s) in the subsequent examination.

5. Scheme of Examinations
   The scheme of examination of a different semester shall be as follows.

### COURSE OF STUDY AND SCHEME OF EXAMINATION

#### SEMESTER - I

<table>
<thead>
<tr>
<th>Part</th>
<th>Title of the course</th>
<th>Instructional hours per week</th>
<th>Exam hours</th>
<th>Credits</th>
<th>Internal Marks</th>
<th>Semester Examination</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Tamil or any other Language paper -I</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>II</td>
<td>English - I</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>Core I - Geology - I</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Core Practical I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Geology Practical -I*</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>III</td>
<td>Allied - I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chemistry Paper -I or Maths -I</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>Allied Practical I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chemistry Practical -I*</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>IV</td>
<td>Skill based Elective course-I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Select any one from the list)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Value education</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
</tbody>
</table>

* - Examinations will be at the end of II semester
### SEMESTER - II

<table>
<thead>
<tr>
<th>Part</th>
<th>Title of the course</th>
<th>Instructional hours per week</th>
<th>Exam hours</th>
<th>Credits</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Tamil or any other Language - II</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>II</td>
<td>English - II</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>III</td>
<td>Core II - Geology</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>III</td>
<td>Core Practical I - Geology *</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>III</td>
<td>Allied II - Chemistry -II or Maths -II</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>III</td>
<td>Allied Practical I - Chemistry -I* or Allied Maths -III</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>IV</td>
<td>Skill based Elective course- II</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>IV</td>
<td>Environmental studies*</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>25</td>
</tr>
</tbody>
</table>

* - Continued from I semester and Examinations will be at the end of II semester
Total Credit for I and II Semester = 45 credits
Total Marks for I and II Semester = 1400 Marks

### SEMESTER - III

<table>
<thead>
<tr>
<th>Part</th>
<th>Title of the course</th>
<th>Instructional hours per week</th>
<th>Exam hours</th>
<th>Credits</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Tamil or any other language paper - III</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>II</td>
<td>English paper - III</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>III</td>
<td>Core III - Geology</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>III</td>
<td>Core Practical II - Geology*</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>III</td>
<td>Allied Physics - I</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>III</td>
<td>Allied Practical I - Physics - I*</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>IV</td>
<td>Skill based Elective course- III</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>IV</td>
<td>Non-Major elective course -I</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>25</td>
</tr>
</tbody>
</table>

* - Examinations will be at the end of IV semester
### B Sc APPLIED GEOLOGY

#### SEMESTER - IV

<table>
<thead>
<tr>
<th>Part</th>
<th>Title of the course</th>
<th>Instructional hours per week</th>
<th>Exam hours</th>
<th>Credits</th>
<th>Internal Marks</th>
<th>Semester Examination</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Tamil or any other Language - IV</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>II</td>
<td>English - IV</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>Core IV - Geology</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>Core Practical II - Geology *</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>Allied II - Physics II</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>Allied Practical I - Physics - I*</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>IV</td>
<td>Skill based Elective Course -IV</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>IV</td>
<td>Non Major elective course -II</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
</tbody>
</table>

* - Continued from III semester and Examinations will be at the end of IV semester
* Total Credit for III and IV Semester = 45 credits
* Total Marks for III and IV Semester = 1400 Marks

#### SEMESTER - V

<table>
<thead>
<tr>
<th>Part</th>
<th>Title of the course</th>
<th>Instructional hours per week</th>
<th>Exam hours</th>
<th>Credits</th>
<th>Internal Marks</th>
<th>Semester Examination</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Core V - Geology</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>I</td>
<td>Core VI - Geology</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>I</td>
<td>Core VII - Geology</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>I</td>
<td>Core VIII - Geology</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>II</td>
<td>Core Practical III - Geology *</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>III</td>
<td>Core Practical IV - Geology *</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>IV</td>
<td>Skill based Elective course-V</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
</tbody>
</table>

* - Examinations will be at the end of VI semester
### SEMESTER - VI

<table>
<thead>
<tr>
<th>Part</th>
<th>Title of the course</th>
<th>Instructional hours per week</th>
<th>Exam hours</th>
<th>Credits</th>
<th>Internal Marks</th>
<th>Semester Examination</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Core Geology -IX</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>Core Geology -X</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>Core Geology -XI</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>Core Geology -XII</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>Core Geology Practical -III*</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>Core Geology Practical -IV*</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>IV</td>
<td>Skill based Elective course- VII (Select any one from the list)</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
</tbody>
</table>

* - Continued from III semester and Examinations will be at the end of VI semester

- Total credit for V and VI semester = 50
- Credits Total Marks for V and VI Semester = 1400
- Marks Total credit for 3 years = 140 Credits
- Total Marks for 3 years = 4200 Marks

6. **Question Paper pattern for Examination**

Time: 3 Hrs.  
Max. Marks - 75

- **Part A:** 10 x 2 = 20 Marks  
  (Answer all Questions) (Two questions from each unit)

- **Part B:** 5 x 5 = 25 Marks  
  (Answer all Questions)

  (One question from each unit with internal choice)

- **Part C:** 3 x 10 = 30 Marks  
  (Answer any three Questions out of five) (One question from each unit)
7. **Passing Minimum**

**Theory :  IA : 25 marks**

<table>
<thead>
<tr>
<th>Evaluation of IA</th>
<th>Passing minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tests</td>
<td>15 marks</td>
</tr>
<tr>
<td>Assignment</td>
<td>05 marks</td>
</tr>
<tr>
<td>Attendance</td>
<td>05 marks</td>
</tr>
<tr>
<td>Total</td>
<td>25 marks</td>
</tr>
<tr>
<td>UE</td>
<td>75 marks</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evaluation of IA</th>
<th>Passing minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA (40%)</td>
<td>10 marks</td>
</tr>
<tr>
<td>UE (40%)</td>
<td>30 marks</td>
</tr>
<tr>
<td>Total</td>
<td>40 marks</td>
</tr>
</tbody>
</table>

**University Examination : 75 marks**

**Practical:**

**IA : 25 Marks**

<table>
<thead>
<tr>
<th>Evaluation of IA</th>
<th>Passing minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field visit, Collections Report</td>
<td>10 marks</td>
</tr>
<tr>
<td>Model Exam</td>
<td>05 marks</td>
</tr>
<tr>
<td>Record Submission</td>
<td>05 marks</td>
</tr>
<tr>
<td>Attendance</td>
<td>05 marks</td>
</tr>
<tr>
<td>Total</td>
<td>25 marks</td>
</tr>
<tr>
<td>UE</td>
<td>75 marks</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evaluation of IA</th>
<th>Passing minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA (40%)</td>
<td>10 marks</td>
</tr>
<tr>
<td>UE (40%)</td>
<td>30 marks</td>
</tr>
<tr>
<td>Total</td>
<td>40 marks</td>
</tr>
</tbody>
</table>

**University Examination : 75 marks**

8. **Classification of Successful candidates**

Candidates who secure not less than 60% of the aggregate marks in the whole examination shall be declared to have passed in First Class. All other successful candidates shall be declared to have passed in Second Class. Candidates who obtain 75% of the marks in the aggregate shall be deemed to have passed in First Class with Distinction provided they pass all the examinations prescribed for the course at first appearance.

Candidates who pass all the examinations prescribed for the course in the first attempt and within a period of three academic years from the year of admission to the course alone are eligible for University Ranking.
Evaluation of Credits

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Cumulative Grade Points Average</th>
<th>Grade Description</th>
<th>Range of Marks*</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>10</td>
<td>Outstanding</td>
<td>90 - 100</td>
</tr>
<tr>
<td>A</td>
<td>9</td>
<td>Excellent</td>
<td>80 - 89</td>
</tr>
<tr>
<td>B</td>
<td>8</td>
<td>Very Good</td>
<td>70 - 89</td>
</tr>
<tr>
<td>C</td>
<td>7</td>
<td>Good</td>
<td>60 - 69</td>
</tr>
<tr>
<td>D</td>
<td>6</td>
<td>Average</td>
<td>50 - 59</td>
</tr>
<tr>
<td>E</td>
<td>5</td>
<td>Satisfactory</td>
<td>40 - 49</td>
</tr>
<tr>
<td>RA</td>
<td>0</td>
<td>Re-Appear</td>
<td>0 - 39</td>
</tr>
</tbody>
</table>

\[
G_P = \frac{(\text{Marks obtained in course} \times \text{credit})}{100}
\]

\[
G_{PA} = \frac{\text{Total Grade Points earned in a semester}}{\text{Total credits registered in a Semester}}
\]

\[
G_{PA} = \frac{\text{Sum of Grade Points earned}}{\text{Sum of credits registered}}
\]

Classification

CGPA 9 and above: Class with Distinction
CGPA between 7 and 8.9: Class
CGPA between 5 and 6.9: Class

Note:
The above classification shall be given for overall performance including Non – Major Electives and Skill based Courses. i.e., For Performance in the Part III only.

9. Maximum duration for the completion of UG Program
The maximum duration for the completion of UG Program shall not exceed twelve semesters.

10. Commencement of this Regulation
These regulations shall take effect from the academic year 2017 - 2018 and thereafter.

11. Transitory Provision
Candidates who were admitted to the UG course of study before 2017 - 2018 shall be permitted to appear for the examinations under those regulations for a period for three years i.e. up to and inclusive of the examination of April/May 2020. Thereafter they will be permitted to appear only under regulations then in force.
Unit – I

Unit – II

Unit – III

Unit – IV
Dynamic Earth: Isostasy, Orogeny and Epeirogeny. origin and evolution of oceans, Geosynclines, Profile of continental margins, Island arcs. Sub Marine Topography features, Principles of Geodesy, neotectonics

Unit – V
Continental Drift, Sea floor spreading theory and evidences: Plate Tectonics. oceanic trenches, volcanic arcs, mid-ocean ridges, Palaeomagnetism and its application, Raised beach, River terraces, river meandering.
Text Books


Reference books

Unit I

Unit II
External processes: Weathering: Physical, Chemical and Biological. Mass wasting: Soil creep, landslide, rock fall, rock slip and mud flow. Landforms produced due to erosion and deposition with reference to: River and Underground water. Drainage pattern, network characteristics, Valleys and their development,

Unit III
Landforms produced due to erosion and deposition with reference to: Glaciers, Winds, and Waves. Uplift – subsidence pattern in coastal areas, Applied Geomorphology: Application in various fields of earth sciences Mineral prospecting, Geohydrology, Civil Engineering and Environmental studies, Geomorphology of India

Unit IV

Unit V
Shear Zones: Brittle and ductile shear zones, geometry and products of shear zones; Mylonites and cataclasites, their origin and significance. Time relationship between crystallization and deformation. Unconformities and basement-cover relations. Structural behaviour of igneous plutons, diapirs and salt domes. Introduction to petrofabric analysis.
Geomorphology

TEXT / REFERENCES BOOKS


Structural Geology

TEXT BOOKS:


REFERENCE BOOKS

1. V.V. Belousov-Structural Geology, Moscow
4. Park, P.G.-Fundamentals of structural Geology, John Willey & Sons,
CORE PRACTICAL I - STRUCTURAL GEOLOGY AND SURVEYING

**Structural Geology**:

Contour maps and their interpretation. Exercises to predict trends of the outcrop of Horizontal, vertical an incline beds with respect to topography – reading of solid conformable maps – deciphering dip and strike of outcrops – construction of map when three points over a bedding plane are given - construction of vertical sections order of superposition – vertical thickness of formations.

Reading of solid fold and fault maps construction of vertical sections – Determination of throw of vertical faults. Reading of unconformable solid maps – construction of sections. Reading of solid maps of areas when more than one structure is involved – determination of comparative ages of structures and intrusions – geological history.

Structural Problems – problems relating to true dip and apparent dip; Determination of vertical and true thickness.

Description of features in Survey of India’s (SOI) toposheet : Extramarginal, marginal, intramarginal information, major conventional signs and symbols, physical and socio-cultural features

**SURVEYING**

Chain survey – prismatic compass survey – plane table survey – leveling. Clinometer Compass and Brunton Compass:-To find out dip and strike of the beds. GPS:- Fundamentals and applications.
B.Sc. APPLIED GEOLOGY

SEMESTER - III

CORE III - PALAEONTOLOGY

Unit I

Unit II

Unit III

Unit IV

Unit V
Mesozoic Reptiles, Siwalik mammals. General classification of plant kingdom – plant fossils from India – A brief account of the following plant fossils: Glossopteris, Gangamopteris, Ptilophyllum, Calamites, Lepidodendron and Sigillaria. Applications of Micro palaeontology

**TEXT BOOKS**


**REFERENCE BOOKS**

Unit I

Unit II

Unit III
Paleozoic Stratigraphy: Distribution of Paleozoic rocks in India, Cambrian of Salt Range, Age of Saline Series, Upper Carboniferous and Permian rocks of Salt Range, Paleozoic rocks of Kashmir Valley, Paleozoic rocks of Spiti Valley, Paleozoic rocks of Peninsular India,

Unit IV

Cenozoic Stratigraphy: Comprehensive account of the geological events took place during Cenozoic era in India, rise of Himalayas, stratigraphy of Siwalik system, fauna and flora of Siwaliks, Tertiary rocks of Assam, Karewa formation, Tertiary rocks of Tamilnadu, Tertiary rocks of Kerala, Pleistocene Glaciation - Mineral wealth of Tertiary rocks of India:
B Sc APPLIED GEOLOGY

TEXTBOOKS
3. Ravindrakumar K.R.- Stratigraphy of India.

REFERENCE BOOKS
PALAEONTOLOGY


MICRO FOSSILS:

Lagena, Nodosaria, Textularia, Operculina, Elphidium, Ammonia.

DIAGRAMS:

Paradoxides, Pentremites, Trigonia, Arca, Meretrix, Murex, Turritella, Nautilus, Spirifer.

Stratigraphy: Arranging the different Indian Stratigraphic horizons in accordance with age, Stratigraphic position, fossil content and order of superposition.
B. Sc. APPLIED GEOLOGY

SEMESTER-IV

CORE V - CRYSTALLOGRAPHY

Unit I


Unit II

Classification of crystals into systems and classes - Holohedral, Hemihedral, Hemimorphic and Enantiomorphic forms in crystals. Elementary knowledge of spherical and stereographic projections. study of the symmetry elements, and forms of the Normal, pyritohedral, tetrahedral and plagiohedral classes of cubic system with special reference to well developed crystals of Galena, Spinel, Garnet, Flourite, Diamond, Pyrite, Tetrahedrite, Boracite and cuprite.

Unit III

Study of symmetry elements and forms of Normal, Hemimorphic, Tripyramidal, Pyramidal Hemimorphic, Sphenoidal and Trapezohedral classes of Tetragonal system with special reference to well developed crystals of zircon, Rutile, Cassiterite, Vesuvianite, Apophyllite, Shellite, Melonite, Wulfenite and Chalcopyrite.

Unit IV

Study of the symmetry elements and forms of Normal, Hemimorphic Tripyramidal, pyramidal Hemimorphic, Trapezohedral, Rhombohedral, Rhombohedral Hemimorphic, Trirhombohedral and Trapezohedral classes of Hexagonal system with special reference to well developed crystals of Beryl, Zincite, Apatite, Calcite, Corundum, Tourmaline, Phenacite and Quartz. Study of the symmetry elements and forms of the Normal, Hemimorphic and Sphenoidal classes of Orthorhombicsystem with special reference to well developed crystals of Barite, olivine topaz, staurolite, Sulphur, Calamine, Struvite and Epsomite.

Unit V

Study of the symmetry elements and forms of the Normal classes of the Monoclinic and Triclinic systems with special reference to well developed crystals of Gypsum, Orthoclase, Albite, Augite, Axinite and Kyanite. Twin crystals – Definitions – Effects of Twinning – laws of twinning – composition plane, twinning plane and twinning axis, indices of twins – simple and repeated (polysynthetic twins), contact and
penetration twins: secondary twins. Study of twin laws pertaining to the following crystals – Fluorite (spinel law), Pyrite (iron cross twin), Rutile (geniculate), Calcite, Quartz (Brazil law), Aragonite (mimetic twin), Staurolite (cruciform), Gypsum, Augite and Feldspars (Carlsbad, Baveno, Manebach, Albite and Pericline).

**TEXTBOOKS**


**REFERENCE BOOKS**

B.Sc. APPLIED GEOLOGY

SEMESTER-V

CORE VI - MINERALOGY

Unit I


Unit II

Mineralogy, structure, chemical composition, optical and physical properties, modes of occurrence and industrial uses of the following group of minerals: Quartz - Feldspar - Feldspathoid - Zeolite.

Unit III

Mineralogy, structure, chemical composition, optical and physical properties, modes of occurrence and industrial uses of the following group of minerals: Pyroxene – Amphibole – Mica - Olivine - Garnet.

Unit IV

Physical and optical properties, chemical composition, uses and modes of occurrence of the following minerals: Epidote, Chlorite, Scapolite, Cordierite, Talc, Serpentine, Steatite, Calcite, Dolomite, Andalusite, Kyanite, Sillimanite, Topaz, Staurolite, Beryl, Tourmaline, Wollastonite, Fluorite, Apatite, Zircon, Rutile, Sphene and Corundum. Unit V

Mineralogy, mode of occurrence, uses and distribution in India of the minerals required for the following industries: Abrasives, Fertilizer, Paint, Refractory, Glass, Ceramic and Cement - Mineral wealth of Tamil Nadu.

REFERENCES AND TEXTBOOKS

B.Sc. APPLIED GEOLOGY

SEMESTER-V

CORE VII - IGNEOUS PETROLOGY

Unit I

Definition of Petrology – Earth zones. Composition and constitution of magmas – Primary and Parental Magmas. Forms of Intrusive igneous rocks: Concordant forms - Sill, Laccolith, Lopolith and Phacolith, Discordant forms - Dykes, Cone Sheets, Volcanic neck, Ring dyke, Batholiths, Stocks, Bosses and Psymaliths. Forms of Extrusive igneous rocks: Lava flows, Pyroclastic deposits - Agglomerate, Lapilli, volcanic ash and volcanic froth

Unit II


Unit III


Unit IV

Texture, Mineralogy, Classification, and Modes of occurrence of: Granite, Granodiorite, Syenite, Diorite, Gabbro, their hypabyssal and volcanic equivalents. Petrographic characters, distribution in India and origin of Pegmatites, Lamprophyres, Alkaline rocks, Dunite, Peridotite and Anorthosites.

Unit V

REFERENCE AND TEXTBOOKS

B.Sc. APPLIED GEOLOGY

SEMESTER-V

CORE VIII - SEDIMENTARY AND METAMORPHIC PETROLOGY

Unit I


Unit II


Unit III


Unit IV


Unit V

REFERENCE AND TEXTBOOKS

2. Huang, W.T.- Petrology, MC Graw Hill
4. Harker, A. - Petrology for Students, Cambridge,
Unit I


Unit II


Unit III


Unit IV

Diagnostic physical properties, chemical composition, uses, modes of occurrence and distribution in India of the following economic minerals. Graphite, Realgar, Orpiment, Stibinite, Molybdenite, Cinnabar,Anglesite, Barite, Gypsum, Celestite, Corundum, Ochre, Ilmenite, Chromite, Franklomite, Cassiterite, Magnesite, Cerussite, Halite, Fluorite, Phosphatic Nodule, Monazite, Wollastonite, Colembite, Tantalite, Samarskite, Asbestos, Steatite and Vermiculite. Mineralogy, mode of occurrence, uses and distribution in India of the following precious metals and minerals. Gold deposits – Gem stones. Character, distribution and mode of occurrence of structural and building materials.
B Sc APPLIED GEOLOGY

Unit V

Mineralogy, mode of occurrences, uses and distribution in India of the following metalliferous deposits – Iron, Manganese, aluminium, copper, lead, Zinc – chromium. Fossil fuels – coal – uses, classification, constitution, origin and distribution in India. Petroleum- composition, uses, theories of origin, oil traps, and important oil fields of India.

TEXT BOOKS AND REFERENCE BOOKS

5. Krishnaswamy ,s. India's Mineral Resources, Oxford and IBH.
B. Sc. APPLIED GEOLOGY

SEMESTER-VI

CORE X - PHOTOGEOLOGY AND REMOTE SENSING

Unit I

Unit II
Types of remote sensing: based on 1) Energy sources: active and passive. 2) Platforms: aerial and satellite and 3) Sensors: optical, thermal, and microwaves. 4) RADAR. Aerial remote sensing: Types of Aerial Photographs: vertical and oblique. Scale of aerial photographs – flight procedures. Stereoscopes: pocket and mirror stereoscopes.

Unit III

Unit IV

Unit V
A short account of the remote sensing techniques in the study of drainage patterns, major land forms, geological structures. Groundwater exploration and mineral exploration.

REFERENCES AND TEXTBOOKS
B. Sc. APPLIED GEOLOGY

SEMESTER-VI

CORE XI - MINING AND ENGINEERING GEOLOGY

Unit I


Unit II


Unit III


Unit IV

Unit V

Tunnels: definition, parts of a tunnel, types, tunnelling in hard and soft rocks, geological investigations, and groundwater conditions. Foundations: definition, geological investigations, and ground water problems. Outline of support structures: rods, bolts, anchors, arches, rings, linings, and retaining walls.

TEXT BOOKS AND REFERENCE BOOKS

2. Mckinstry - Mining Geology.

REFERENCE AND TEXT BOOKS

Unit I


Unit II


Unit III


Unit IV

Unit V


REFERENCE AND TEXTBOOKS


REFERENCES AND TEXTBOOKS


SIMPLE TWIN MODELS
Galena, Fluorite, Pyrite, Rutile, Calcite, Quartz, Staurolite, Gypsum, Augite, Orthoclase, Albite.

MINERALOGY
Megascopic Mineralogy:

Microscopic Mineralogy:
Description of optical properties and their identification of the following minerals: Quartz, Orthoclase, Microcline, Albite, Labradorite, Nepheline, Leucite, Enstatite, Hypersthene, Augite, Diopside, Hornblende, Glaucophane, Biotite, Muscovite, Olivine, Epidote, Garnet, Apatite, Zircon, Sphene, Tourmaline, Calcite, Andalusite, Kyanite, Sillimanite, Staurolite, and Cordierite

Blow Pipe:
Identification of the following mineral powders by simple blow pipe tests: Apatite, Barite, Calcite, Celestite, Cerusite, chalcopyrite, Galena, Gypsum, Chromite, Haematite, Magnesite, Magnetite, Psilomelane, Pyrolusite, Siderite, Sphalerite, Strontianite, Witherite, Stibnite, Ilmenite and Wolframite.
ECONOMIC GEOLOGY

Megascopic identification and description, Indian occurrences and uses of the following ore and industrial Minerals:


PETROLOGY

Megascopic identification of the following rocks:


Microscopic identification and description of the following rocks:

B.Sc. APPLIED GEOLOGY

SEMESTER - I

SKILL BASED ELECTIVE COURSE

SBEC - I - PRINCIPLES OF SURVEYING

Unit I

Surveying - Definition - Scope and content - types of surveying - Area measurement - Height determination - Advantages of survey.

Unit II

Chain survey - Accessibility - FMB - Methods of chain survey - Triangulation - Open and Closed traverse - Plotting of chain survey and results.

Unit III

Prismatic compass - Parts of prismatic compass - Accessories - Traverse - Plotting of prismatic compass - Errors and its corrections - Bowditich's method of correction - calculation of bearings from included angles.

Unit IV


Unit V

Height measurement - Determination of height - by Dumpy level - Parts of Dumpy level - Methods of dumpy level survey - Height measurement by Indian Clinometer and Abney level.

Reference books

1. Lekh Raj & Raghunandan Singh - Map work and practical geography.
2. Jayachandran - Practical geography.
B.Sc. APPLIED GEOLOGY

SEMESTER - II

SKILL BASED ELECTIVE COURSE

SBEC II - REMOTE SENSING AND GIS

Unit I


Unit II


Unit III

Fundamentals of Aerial Remote Sensing: Components of Aerial Camera, Types of Aerial Photographs, Marginal Information of Aerial Photographs, elements of Photo Interpretation.

Unit IV


Unit V

Geographical Information Systems (GIS) Meaning- Developments-Raster and Vector data-Data integration-Global positioning system (GPS) Advantages and Limitations of GIS and GPS.

REFERENCE BOOKS

B.Sc. APPLIED GEOLOGY

SEMESTER - III

SKILL BASED ELECTIVE COURSE

SBEC III - CARTOGRAPHY

Unit I

Unit II

Unit III
Symbolization: Types of Cartographic symbols - Point, line, and Area symbols - Qualitative and Quantitative data generalization.

Unit IV
Map Design and Layout: General design problems - Principles of Cartographic design and design of map symbols - Lettering – Lettering methods, Positioning of letters - Geographical names.

Unit V

REFERENCE BOOKS
1. Misra R.P. and A.P. Ramesh - Fundamentals of Cartography
2. Robinson - Elements of Cartography
4. Raiz - Principles of Cartography.
B.Sc. APPLIED GEOLOGY

SEMESTER - IV

SKILL BASED ELECTIVE COURSE

SBEC IV - FIELD HYDROGEOLOGY AND TECHNIQUES

Unit –I

Importance of Hydrology – Difference between Hydrogeology and Hydrology, Water bearing geologic formations. Ground water provinces of Tamil Nadu. Collection of rain fall data. Short account on Thiessen Polygon isohyetal maps.

Unit –II

Hydrogeologic parameters: Calculation of Porosity and Permeability, Pump test data, calculation of ground water fluctuations.

Unit - III

Wells – Well inventory survey: water level, water level fluctuation, subsurface layers (Soil thickness, weathered zone, Fractured zone, Bed rock) - Well construction - Well logging - Sedimentary aquifers: Sandstone, limestone.

Unit – IV

Hard rock aquifers: charnockites, Gneiss, Granite formation - Field observation and measurement of soil moisture zone, zone of aeration, zone of saturation.

Unit – V


TEXTBOOKS:


B Sc APPLIED GEOLOGY

B.Sc. APPLIED GEOLOGY
SEMESTER - V
SKILL BASED ELECTIVE COURSE
SBEC V - GEOSTATISTICS AND COMPUTER APPLICATIONS

Unit – I

Unit – II
Sampling and Sampling plan in Geoscience: Theoretical basis and sampling: Sample Random Sampling Systematic and stratified and cluster sampling: Standard errors. Null hypothesis. Correlation and Regression Analysis in Geoscience

Unit – III

Unit – V
Introduction to GIS softwares in GIS, Utility of computer software in geological studies – Bar diagram, pie diagram, role diagrams, scatter diagram, X-Y plots.

Text Books
1. Balagurusamy, Introduction to Computers

Reference Books
B.Sc. APPLIED GEOLOGY

SEMESTER - V

SKILL BASED ELECTIVE COURSE

SBEC VI - GEMOLOGY AND GEMSTONE EVALUATION

Unit – I

Unit – II

Unit – III

Unit – IV
Weight standard schemes used in gemology – 4Cs scheme for diamonds. Polishing of gemstones – polishing angles and limits. Polishing equipment and instruments. Feasibility and economics of gem industries in India with special reference to Tamil Nadu. Grading, valuation and pricing of gems.

Unit – V
Gemstone prospecting: Host rocks – gemstone mineralization – deposits. Exploration techniques and exploitation. Gemstone occurrences in India and with special references to Tamil Nadu.

Reference & Text Book
B. Sc. APPLIED GEOLOGY

SEMESTER - VI

SKILL BASED ELECTIVE COURSE

SBEC VII - GRANITE EXPLORATION AND EXPLOITATION

UNIT-I

UNIT-II
Mining methods of Granites - Marking methods. Methods of cutting and polishing of Granites.

UNIT III

UNIT IV
Machineries used in Granite Industries – Wire saw machine, Cutting and Polishing Machines.

UNIT-V
Marketing, pricing and Export of Granites. Granites and granite industries of India and Tamilnadu. End uses of Granite wastes. Manufacture Sand

Reference:
2. Economic minerals – U. Prasad-CBS
5. Field Geology-Mathur
B.Sc. APPLIED GEOLOGY
SKILL BASED ELECTIVE COURSE
SBEC VIII - MINES AND MINERALS LEGISLATION OF INDIA

Unit – I

Unit – II

Unit – III

Unit – IV

Unit – V

Reference Books
B. Sc. APPLIED GEOLOGY

SKILL BASED ELECTIVE COURSE

SBEC IX - INTRODUCTION TO GEOINSTRUMENTATION

Unit – I
Basic equipments: Description, handling and applications of the following equipments: Hammers, Chisels, Hand lenses, Clinometer, Brunton Compass, Jacob's staff, Pedometer.

Unit – II
Survey equipments: Chain survey, Plane table, Prismatic Compass, Theodolite, GPS. Field photographic Techniques, Spot analysis Kit for water and soil test.

Unit – III
Geophysical Survey Equipment: Gravimeters, Magnetometers, Resistivity survey equipments, seismic survey equipments, scintillation counter, Well logging instruments.

Unit – IV
Pocket stereoscope, Mirror Stereoscope, Stereometer, Pantograph, Rotometer, Plotting equipments. Petrological microscope, Ore microscope, Photomicrograph equipment, Stereomicroscope.

Unit – V
Geochemical Equipment : PH & Eh meters, Potentiometers, TDS determination, Chromatographic Techniques, AA Spectrometer, ICP – MS, XRF – XRD,

Reference Books
1. Field Geology - S.M. Mathur,
2. Field Geology - GoKhale
3. Field Geology - F. Lahee
4. Field Geology - R. Compton
5. Surveying - Punmia
6. Geophysics - Telford
7. Geophysics - Ramachandra Rao
8. Mineralogy - Dennan
9. Text Book of Surveying - S.K. Husain and M.S. Nagaraj
B.Sc. APPLIED GEOLOGY

SKILL BASED ELECTIVE COURSE

SBEC X - WATER QUALITY ANALYSIS

Unit – I

Physical properties of water: Colour, odour, taste, temperature, turbidity & viscosity. Methods of analysis of physical properties. World Health Organisation (WHO) and Bureau of Indian Standards (BIS).

Unit – II

Chemical properties of water: PH-alkalinity, acidity and their measurements, ionization potential, gas solubility, precipitation and dissolution of ions, equivalent weight and its measurement, colloids and coagulation, insoluble components and their measurements.

Unit – III


Unit – IV

Utility of Standards required for Potable, Agricultural and Industrial Purposes. Tools used for assessing the quality of water.

Unit – V


References

B. Sc. APPLIED GEOLOGY

SKILL BASED ELECTIVE COURSE

SBEC XI - MAPPING TECHNIQUES IN GEOLOGY

Unit – I

Unit – II

Unit – III
Topographic maps:-definition of topography- parts of topographic map – features represented, map enlargement, reduction and preparation of base map – height / elevation datum in topographic maps.

Unit – IV

Unit – V

Reference
B.Sc. APPLIED GEOLOGY
SKILL BASED ELECTIVE COURSE
SBEC XII - GEOLOGY FOR COMPETITIVE EXAMINATIONS

Unit – I
Types of competitive examinations: State and Central competitive examinations – TNPSC, UPSC (Civil Services, GSI, IFS), UGC-CSIR, ONGC, AMD, Coal India Ltd etc.

Unit – II
Awareness of syllabus prescribed for various competitive examinations. Objective and descriptive type of questions. Preparation strategies - Collection of previous question papers - Internet and library search for information.

Unit – III
Scope and limits of objective type examinations - Pattern and style of objective type questions - Level of difficulty and standard expected - Long term study and planning. Preparation strategies for short answer and short essay type examination.

Unit – IV
Study methods - objective type - short essay type. Examination techniques: -pre- exam preparation -Writing / choosing questions from simple to complex (or) vem known to partly known before answering/ writing answers –Time concept and examination ethics.

Unit – V
Interview - Basic English, Mathematical Ability, Logical Reasoning and Mental Aptitude - Group Discussion, Technical Interview and Management round. Dress code and Physical Fitness.

References
7. Jhulka. A. (1992) Objective Geology, CBCS, Delhi,
B Sc APPLIED GEOLOGY

B.Sc. APPLIED GEOLOGY
NON MAJOR ELECTIVE COURSE
NMEC I - OCEANOGRAPHY

Unit I

Unit II
Relief Features of the Major Oceans: Atlantic, Pacific and Indian Ocean - Horizontal and Vertical Distribution of Seawater Temperature, Salinity: Factors Affecting Salinity and Distribution.

Unit III

Unit IV
Marine Deposits: Classification and Distribution - Coral Reefs types - Conditions for the Growth.

Unit V
Marine Resources: Types - Distribution and Uses - Tidal Energy - Role of National Institute of Oceanography in India.

Reference books:
B.Sc. APPLIED GEOLOGY
NON MAJOR ELECTIVE COURSE
NMEC II - CLIMATOLOGY

Unit I
Definition and Significances of Climatology - Rotation and Revolution of the Earth, Solstice, Equinox and Seasons, Elements of Weather and Climate, Composition and Structure of the Atmosphere, Isolation: factors affecting Isolation, Global energy budget, Horizontal and Vertical Distribution Inversion of Temperature and factors affecting them.

Unit II

Unit III
Atmospheric moisture and Precipitation: Humidity types - Condensation - Cloud types - Precipitation and Rainfall: Types and measurements.

Unit IV
Air Masses and Fronts: types, classification and properties - Atmospheric Disturbances: Tropical, Temperate Cyclones, thunderstorms and tornadoes - Origin, Development and associated weather conditions.

Unit V:
Climatic Classification: Need and Basis of Climatic Classification- Koppen's Climatic Classification - Weather forecasting: Observation, Types and Uses.

REFERENCE BOOKS
B.Sc. APPLIED GEOLOGY

NON MAJOR ELECTIVE COURSE

NMEC III - BASIC GEOCHEMISTRY

Unit - I
Origin, abundance and distribution of elements in the universe solar system and earth – composition of crust, mantle, core, hydrosphere and atmosphere. - Geochemical classification of elements.

Unit - II
Basic crystal chemistry: - Minerals as chemical compounds-bonding – ionization potential-electronegativity-periodic table of elements: periodic law and its utility.

Unit – III
Geochemical processes and their geochemical signatures - Processes controlling chemical composition of igneous, metamorphic, and sedimentary rocks.

Unit – IV
Geochemistry of REE, trace elements, stable and radiogenic isotope and their applications.

Unit – V
Geochemistry to mineral exploration: - Elements, dispersion and halos around an ore body- sampling methodology-analytical techniques: AAS-ICP-MS- Gravimetry – chromatography-flame photometry-DTA.

Reference:
B.Sc. APPLIED GEOLOGY

NON MAJOR ELECTIVE COURSE

NMEC IV - BASIC GEOPHYSICS

Unit I

Definition and scope of geophysics. Gross geophysical properties of Earth: Surface gravity variation, electrical and magnetic properties of rock.

Unit II

Seismic properties of rocks, Densities of various layers of earth (Lithosphere). Distribution of density and pressure within earth.

Unit III


Unit IV


Unit V

Isostasy: definition – scope – different theories and limitations of Isostasy. Introduction to geophysical tools.

References

B.Sc. APPLIED GEOLOGY

NON MAJOR ELECTIVE COURSE

NMEC V - GEOHAZARDS

Unit – I

Unit – II

Unit – III


Unit – V

Suggested Books
B.Sc. APPLIED GEOLOGY
NON MAJOR ELECTIVE COURSE
NMEC VI - GROUNDWATER MANAGEMENT AND RAINWATER HARVESTING

Unit – I

Unit – II

Unit – III

Unit – IV

Unit – V

References
B Sc APPLIED GEOLOGY

GEOLOGICAL FIELD WORK

It is an integral part of the course, students should be taken to a field training during the academic year.

First Year

Students should be taken to the local area for studying geomorphological, structural aspects of geology. The duration of the trip may be a week and submit a report to the department.

Second Year

Students should be taken to nearby area and familiarize Paleontological and Stratigraphical aspect, collect geological samples from the field and display at the time of their practical examination for internal evaluation. The duration may be a week.

Third Year

A visit to geologically interested and mineralized zones within Tamilnadu it include, mine visit, geological mapping, minerals, rocks collection and display at the time of their practical examination for internal evaluation. The duration may be for two weeks.
B.Sc. APPLIED GEOLOGY

ALLIED GEOLOGY –I

Unit I


Unit II


Unit III


Unit IV


Unit V

B Sc APPLIED GEOLOGY

Reference and Textbooks

B.Sc. APPLIED GEOLOGY

ALLIED GEOLOGY –II

Unit I

Palaeontology: Definition of Palaeontology and fossils. Outlines of modes of preservation in sedimentary rocks. Brief account of the uses of fossils. Study of the morphological characters and geological age of the following fossil groups: pelecypods, gastropods, cephalopods, brachiopods, corals, and trilobites.

Unit II

Stratigraphy: Definition and scope of Stratigraphy. Outline of the Geological Time Scale. Brief account of the following geological formations in India: Dharwar Group, Cuddapah Group, Vindhyan Group, Gondwana Group, Cretaceous formations of Tiruchirapalli, and Karewa Formation.

Unit III

Igneous Petrology: Definition of igneous petrology and igneous rocks. Forms of igneous rocks: sill, lopolith, laccolith, phacolith, dyke, and batholith. Brief description of the following igneous rocks: dunite, pyroxenite, gabbro, dolerite, syenite, granite, pegmatite, aplite, andesite, and basalt.

Unit IV


Unit V

Economic Geology: An outline of the following processes of ore formation: magmatic–hydrothermal–placer–marine evaporites. Brief description of the physical properties and Indian occurrences of the following ore and industrial minerals: graphite, bauxite, magnesite, hematite, magnetite, chromite, gold, pyrolusite, pyrite, galena, asbestos, gypsum, chalk, calcite, dolomite, barite, and kaolin. Brief description of the following coal types: peat, lignite, bituminous, and anthracite. Brief introduction to petroleum, its origin and occurrence in India.

Reference and Textbooks
B Sc APPLIED GEOLOGY

B.Sc. APPLIED GEOLOGY

ALLIED GEOLOGY PRACTICAL

Code:


**Mineralogy:**


**Petrology:**

Identification and physical description of the following rocks: Igneous rocks: granite, pegmatite, syenite, diorite, gabbro, dolerite, dunite, pyroxenite. Metamorphic rocks: slate, mica schist, chlorite schist, hornblende gneiss, garnet-mica gneiss, granulite, marble. Sedimentary rocks: sandstone, conglomerate, arkose, grit, shale, limestone.

**Fossils:**


**Geological Maps:**
