

SKILL ENHANCEMENT COURSE

DEPARTMENT: GEOLOGY

SESSION: 2022-23

- Number of students undertaking project work/field work/ internships (in Skill-Enhancement Elective Course):

Programme name [BA/BSc/BCom in(Honours/ Regular)]	Course Code	Name of the Course that offers project work/field work/internship	Year of offering	Total number of students
B.Sc. 3 rd Semester (H)	GLG-SE-3014	Basic Field Training	2022	05
B.Sc. 5 th Semester	GLG-SE-5014	Geo-chemistry	2022	02
B.Sc.4 th Semester (H)	GLG-SE-4034	Stratigraphy and Palaeontological Field work	2023	05
B.Sc. 6 th Semester	GLG-SE-6014	Photogeology and Remote Sensing	2023	02

Syllabus for Skill Enhancement Course - (SEC) /2021

3rd Semester (Honours) / CBCS

Paper Code : GLG-SE-3014 Paper Name : Basic Field Training

Total Marks: 50

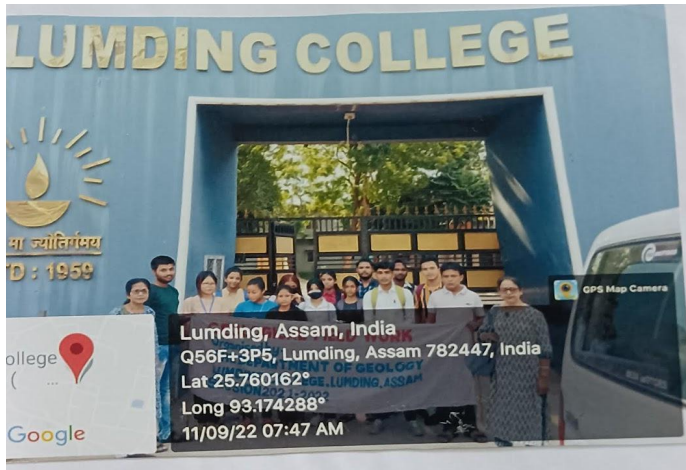
Unit-1: General characteristics of a toposheet: Scale of a toposheet / topographical map, latitude & longitude; Method of numbering of Toposheets ; Method of orientation of a topographic sheet in the field; Use of Brunton/clinometer compass to measure the value of dip, dip direction and strike, pitch and plunge in the field; Taking bearings using brunton/ clinometer compass; Marking locations in toposheet; Study of contour patterns to indicate different landforms e.g. valley, plateau, escarpment.

Unit-2: Identification of igneous rocks : Granite, gabbro, basalt, rhyolite, pegmatite; Structures of igneous rocks: Vesicular and amygdaloidal structure, sheet structure, primary joints; Textures of igneous rocks : Porphyritic, poikilitic, ophitic, sub-ophitic, myrmekite (intergrowth) texture.

Unit -3 : Identification of common sedimentary rocks- Sandstone, siltstone, shale, limestone, conglomerate, breccias; Textures of sedimentary rock, structures of sedimentary rock : Cross stratification, graded bedding, ripple marks, unconformities, offlap , overlap; Litholog measurement in sedimentary sections using graphs.

Unit-4: Identification of metamorphic rocks: phyllite, schist, gneiss, quartzite, marble, amphibolite, mylonite, migmatites; Identification of metamorphic textures: Granoblastic, Porphyroblastic, Xenoblastic; Identification of different structural elements in the field : fold, fault, joint, foliation, lineation, schistosity, gneissosity, pinch and swell structure, shear zone.

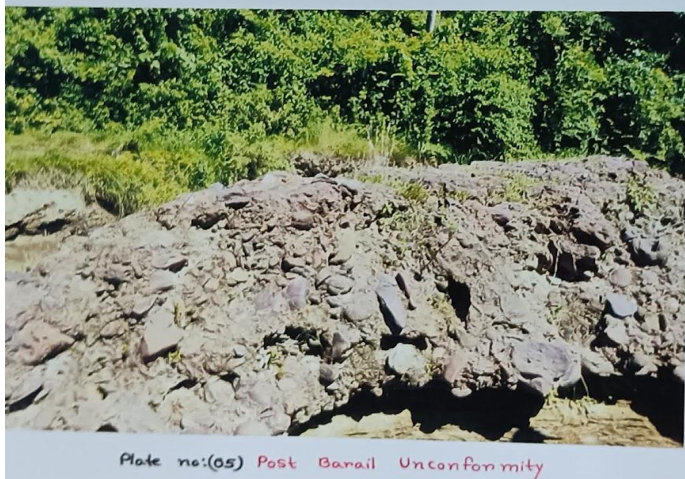
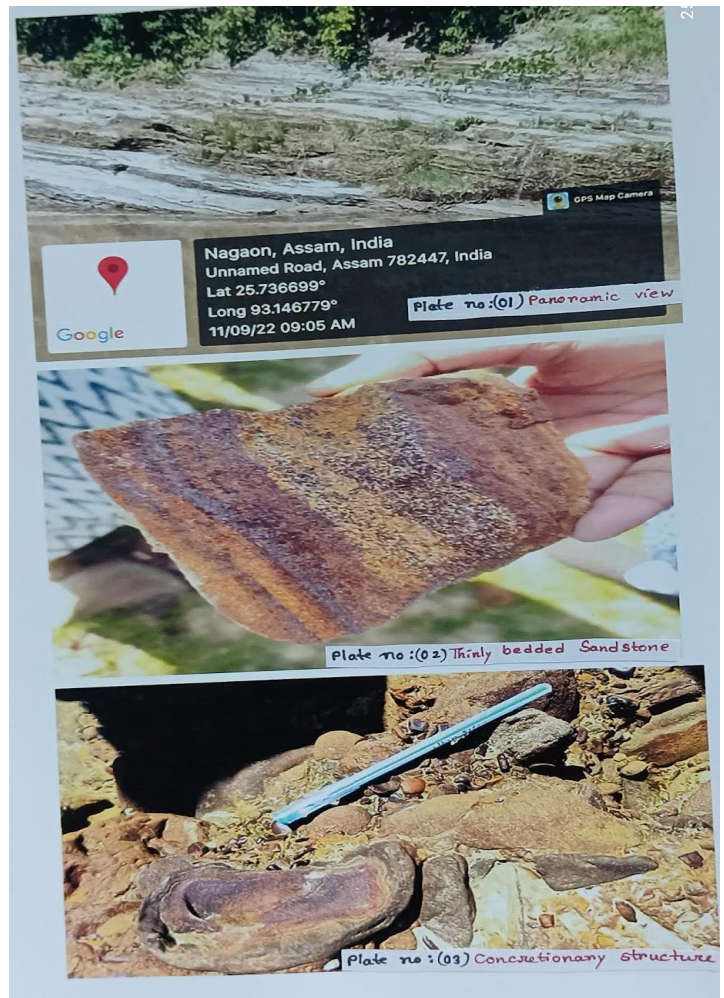
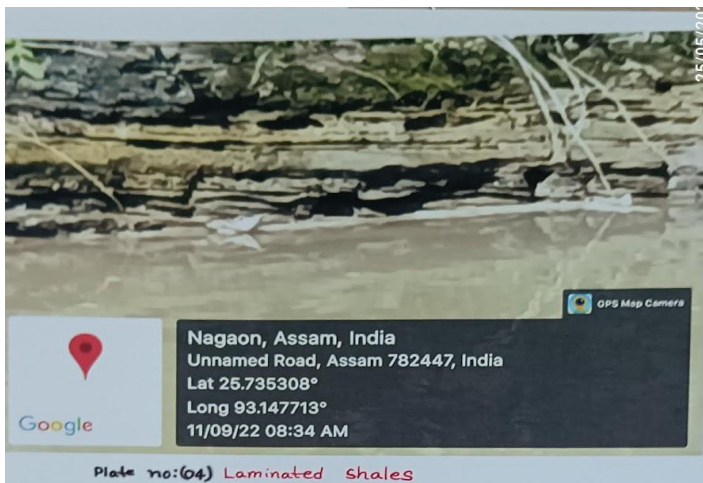
COMBINED FIELDWORK FOR BASIC FIELD TRAINING & HONOURS COURSES:



LUMDING COLLEGE
LUMDING

Students' Attendance Register

Class 3rd Sem (Skill)/4th Sem (Sci)
Stream Science
Subjects Geology
Session 2022-23



Roll No.	NAME
14	Abhishek Majumder
21	Riya Rakshit
24	Chandan Chaudhary
39	Ritika Nath
72	Nilema Das
74	Rupam Das

FIELD REPORT:

FIELD REPORT SUBMITTED
IN LIEU OF PAPER: GLG-SE-3014 IN PART
FULFILMENT FOR THE DEGREE OF
BACHELOR OF SCIENCE IN GEOLOGY

SUBMITTED BY:
NAME: Ritika Nath
ROLL-NO: US-211-304-0049

FIELD REPORT:

CHAPTER - 1: INTRODUCTION

1.1 General Introduction :

The present course of field study in certain parts of Mandarisa areas has been carried out on 11.09.2022 by the students of Degree 3rd Semester (Honours), as a part fulfillment of the syllabus prescribed by the University of Guwahati. This field study was organized by the department of Geology, Lumding College, Lumding.

The main purpose of this field study is –

- To study and interpret the different lithologic units, topographic formula of the area.
- To determine the location of different point on the outcrop where operations were made.
- To study and determine attitudes of the planer and linear structures, and contacts of different lithologic units of the area.
- To note all the geological features observed in the field and report these in the field notebook.

1.2 Location and Accessibility:

The area under investigation lies in between the longitude 93.15° East and latitude 25.72° North and is covered by the survey of India Toposheet No. 83 G/2.

The area, Mandarisa, which is thoroughly studied and mapped lies at a distance of about 6 K.M. from Lumding. Lumding-Badarapur meterganga railway line passes through Mandarisa with railway station at this place. The area is accessible only in dry season and it becomes inaccessible during monsoon spreading in between May to October due to heavy rain and landslide.

1.3 Topography and Drainage:

The area is characterized by relatively low hills dissected by interspersed valley. Hills are denudation and composed mainly of Sandstones of Barail Group. The valleys are made up of Sandstones of bluish grey color. The Surma Group of the area mapped. The Surma Group of rocks generally occupies the relatively low mounds in the Southern and Northern parts of the area.

Main drainage system is controlled by Lumding and Chota-Langphor river, which are tributaries of Kopili river and forms a part of Kopili sub basins. The Lumding river flows in

CHAPTER -4: STRUCTURE

Geotectonically Assam has been divided into (i) comparatively stable shield area of Mikir Hills, (ii) Platform areas peripheral to the shield areas now covering the Brahmaputra valley and N.F.Hills, (iii) Transitional zones between the platform and geosynclines (Director general, G&T, 1974)

The Tertiary sequence mapped in the area covering probably the group (ii), where the sediments are buried by major tectonic lineaments which remain active through out the different stage of tectonic cycles during Upper Cretaceous to Pleistocene time.

The present area falls about 60km. North of Haflong-Disang thrust and South East of Belt of Schuppen. Actually the area marks the North-Western limit of the Belt of Schuppen. The Naga thrust is only a few km South-Eastern of the area.

The recognizable structures recorded in the field are described below:

4.1 Bedding:

The bedding is the most dominant penetrative planar fabric prevailed in the area and marked by different color and compositional bandings in the rock formations. It is best observed as thin compositional and color bands in sandstones of Barail Group, alternating different compositional bands. The thickness of the beds varies from a few mm. to as much as 10cm. in which the thinnest part has been observed in laminated shale, sandstone and siltstones, whereas the thickest part is observed in the massive portion of sandstones. [Plate – 2]

The sandstones are medium grained and thinly bedded. The bedding dips $2^{\circ} \rightarrow 150^{\circ}$, $6^{\circ} \rightarrow 180^{\circ}$, $11^{\circ} \rightarrow 135^{\circ}$ and $6^{\circ} \rightarrow 251^{\circ}$. The main current direction is $20^{\circ} \rightarrow 240^{\circ}$. [Plate – 2]

4.2 Cleavage/Fracture Cleavage:

Shales of both Surmas and Barail Group exhibits secondary fissile planar structure in the form of fractures with limited extend at a few places, viz at Lumding river.

Skill Enhancement Course (SEC-3)

Paper Code: GLG-SE-5014

Paper Name: GEOCHEMISTRY

Credits: 4 (100)

Theory = 50
1st A = 2 x 10 = 20
Pract = 20
Viva = 10

Paper Type	Paper Code	Paper Name	Total Mark	Distribution of mark					Paper Credit
				End Semester Mark		Internal Mark			
				Theory	Practical	Sessional	Practical	Attendance	
SEC-3	GLG-SE-5014	Geochemistry	60	48	—	8	—	4	4

THEORY

Marks = 48

Unit-1: Geochemistry

48

- Introduction to Geochemistry, Basic knowledge about crystal chemistry, types of chemical bonds, co-ordination number, elementary idea of periodic table.
- Cosmic abundance of elements; composition of the planets and meteorites, geochemical evolution of the earth and geochemical cycles.
- Goldschmidt's geochemical classification of elements, distribution of major, minor and trace elements in igneous, metamorphic and sedimentary rocks.
- Elements of geochemical thermodynamics; isomorphism and polymorphism; isotope geology.

26/05/2024 2

LUMDING COLLEGE LUMDING

Students' Attendance Register

Class

Sem. / 6th Sem

Stream

Science

Subjects

Geology - SEC.

Session

2022-23

FIELD TRAINING:



Nagaon, Assam, India
Unnamed Road, Assam 782447, India

Roll No.

NAME

101 Rohan Singh

103. Tej Bahadur Chhetry

104. Shikhi

HOME ASSIGNMENT:

36

Name :- Rohan Singh
Class :- Bsc 5th Semester (RE)
Sub :- Geology Paper: GLG-SE-5014
Roll No :- 20061836 US-201-304-0060
Reg No :- 20061836
Topic :- Meteorites and their types
 Goldschmidt Geochemical
 Classification of Elements
Home Assignment

18+18 (36)

Meteorites and their types

Meteorites are part of the solar system fossil fragments of disrupted asteroids that eventually land on earth. There are presumably millions of meteorites of all sizes in the solar system, from the finest dust particles to those that are miles in diameter. Meteorites is continually falling on earth mostly in the form of dust undetectable except by special means. Our knowledge of the larger and more spectacular ones that are seen to fall or from objects that are recognised as meteorites by the special character distinguishing them from terrestrial rocks.

Meteorites consists essentially of a nickel-iron alloy, of crystalline silicate, mainly olivine or pyroxene, the iron sulphide mineral, or of a mixture of the Meteorites may be grouped as follows:-

- ① Siderites or irons (average 98% metal)
- ② Siderolites or stony irons (average 50% metal 50% silicate)
- ③ Aerolites or stones

Siderites :- The siderites, or iron meteorites, consist essentially of one or two nickel-iron metallic phase (Ni is usually between 4 and 20% only greater), generally with accessory kamacite, schreibersite (Fe, Ni, CO), P and graphite.

Geochemical Classification

The geochemical classification of the elements also called the Goldschmidt classification because it is the result of work undertaken 1920s by the chemist Victor Goldschmidt; provides an understanding of the origin of the various proportions of chemical elements in the earth's minerals and rocks and more generally in the rock of planets and meteorites. The geochemical nature of an animal could be established by measuring by its distribution b/w their liquid phases of metal sulphide and silicate.

Goldschmidt introduced four classes of elements according to its geochemical affinity into one of four groups; siderophile, chalcophile, lithophile and atmophile. Some elements show affinity for more than one group because the distribution of any element is dependent to some extent on temperature and the chemical environment of the system as a whole.

Siderophile elements :- As a result of the partition difference of the earth some elements have been concentrated in the metal phase (earth core) and are called siderophile elements. They are strongly depleted in the earth

The achondrites are a diverse group of stony meteorites that do not contain chondrules and are usually much more coarsely crystalline than chondrites. Many achondrites resemble terrestrial igneous rocks in composition and texture, hence have probably crystallized from a silicate melt.

Tektites

They are often considered with meteorites, consist of a silica-rich glass (average about 75% SiO₂), resembling obsidian, yet distinct from terrestrial obsidians in composition and texture. They have an unusual chemical composition which consists of the conjunction of high silica and comparatively high alumina, potash and lime with low magnesia and soda. Tektites are found generally masses in areas that preclude a volcanic origin. Unlike meteorites, tektites have not been observed to fall.

18

18/01/23

GLIMPSES OF THEORY CLASSES:

5th Sem (SBC)

Roll No.	NAME	Marks of default
101	Rohan Singh	
103	Tej Bahadur Chakraborty	
	Hareeram Chakraborty	

CLASS DIARY

Department: Geology Date: 01.02.23

Name of the Teacher	Class	Class Timings	Topics taught	Allotted/Extra	Signature
Dr. Nibedita Dutta	5th Sem (H)	11:30	Strike & Dip	Allotted	Dr. Nibedita Dutta
		12:30	and importance of Strike & Dip		
	6th Sem (SBC)	1:30	Aerial photography and types of photographs	Extra Allotted	Dr. Nibedita Dutta

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Lumding, Hojai, Assam

CLASS DIARY

Department: Geology Date: 02.02.23

Name of the Teacher	Class	Class Timings	Topics taught	Allotted/Extra	Signature
Dr. Nibedita Dutta	4th Sem (RC)	10:30	Superposition of Strata, Non-conformity	Allotted	Dr. Nibedita Dutta
	2nd Sem (H)	11:30	Topographic maps, scale, contour maps, different features from contour pattern	Allotted	Dr. Nibedita Dutta
Dr. Sujata Sen	6th Sem (H)	10:30	Engineering Geology	Allotted	Dr. Sujata Sen
	4th Sem (H)	12:30	Metamorphic	Allotted	Dr. Sujata Sen
		1:30	Petrology		
Dr. Nibedita Dutta	6th Sem (SBC)	12:30	Limitations of aerial photography	Allotted	Dr. Nibedita Dutta

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Lumding, Hojai, Assam

CLASS DIARY

Department: Geology Date: 03.02.23

Name of the Teacher	Class	Class Timings	Topics taught	Allotted/Extra	Signature
Dr. Nibedita Dutta	6th Sem (H)	10:30	Concept of Remote Sensing and EMR and applications	Allotted	Dr. Nibedita Dutta
	6th Sem (SBC)				

LUMDING COLLEGE
Lumding, Hojai, Assam

CLASS DIARY

Department: Geology Date: 16.02.23

Name of the Teacher	Class	Class Timings	Topics taught	Allotted/Extra	Signature
Dr. Nibedita Dutta	4th Sem (RC)	10:30	Sedimentary Facies	Allotted	Dr. Nibedita Dutta
Dr. Sujata Sen	6th Sem (H)	9:30	Geophysical Methods	Allotted	Dr. Sujata Sen
Dr. Nibedita Dutta	2nd Sem (H)	11:30	Recognition of faults	Allotted	Dr. Nibedita Dutta
	6th Sem (SBC)	12:30	Vector and Barlow data	Allotted	Dr. Nibedita Dutta
		1:30			