



पूर्वोत्तर पर्वतीय विश्वविद्यालय
पू० प० विवि० परिसर, शिलांग-७९३०२२ (मेघालय)
North-Eastern Hill University
NEHU Campus, Shillong - 793 022 (Meghalaya)

Head, Department of Geology

Dated: 10.09.2021

NOTICE

The M. Sc. (Geology) Third Semester Programme offers two Open papers viz. GELO-304 (Mineral Exploration and Mining Geology – 4 credits) and GELO-305 (Geoinformatics – 2 credits). Detailed Syllabus for the papers is attached.

The interested students may submit their applications for the above-mentioned courses through their respective Head's/ Teacher In-charge on or before **28th September 2021** through email (hodgeology@nehu.ac.in).

Head

PROF. DEVESH WALIA
Head, Department of Geology
NEHU, Shillong-793022

GELO-304 Mineral Exploration and Mining Geology**4 Credits**

Unit I: Geological Prospecting and Exploration: Definitions and Principles; Methods of Prospecting; Field evidences - Criteria and Guides; Methods of Exploration – Surface and sub-surface; Stages of exploration. Sampling: procedure and methods. Preparation of samples, and errors in sampling. Geological plans and sections for ore body evaluation; Concept of cut-off grade. Estimation of ore reserves; Geo-environmental aspects for mineral exploration; Development of mineral deposits.

Unit II: Criteria and guides for mineral search. Geochemical Exploration: mobility of elements and their primary & secondary dispersion; pathfinder and target elements. Primary and secondary dispersions of elements. Determination of background, and geochemical anomalies; geochemical methods of mineral exploration. Geophysical exploration: Principles and methods. Geobotanical Exploration: Principles and methods.

Unit III: Mining Methods: Placer mining methods, open pit methods, Underground mining methods, Coal Mining methods and Ocean bottom mining methods; their advantages and disadvantages. Ventilation in underground mining: Purpose, types and arrangements of ventilation in underground mining. Mining hazards and safety measures. Ore dressing techniques and its importance; Concentration processes: Magnetic and electrostatic separation, gravity concentration; Froth Floatation, Amalgamation and Agglomeration. Role of Bacteria in Beneficiation of coal and lean grade ores.

Unit IV: Surface Mining: Deposits amenable to surface mining; Box-cut - definition, objectives, types and their applicability, parameters, and methods; Production benches - objectives, formation and bench parameters. Hydraulic mining. Underground Coal Mining: Deposits amenable to underground coal mining. Underground coal mining methods: room and pillar and Longwall methods. Methods for mining steeply inclined seams and thick seams; Underground Metal Mining: Deposits amenable to underground metal mining; Shape, size and position of drifts and cross-cuts; Raises and winzes; Underground metal mining methods: types, advantages and disadvantages.

GELO-305 Geoinformatics**2 Credits**

Unit I: Remote Sensing: principles and significance. Electromagnetic Radiation – Characteristics. Map projections: Transverse Mercator, Universal Transverse Mercator (UTM). Aerial photos: classification, scale, resolution, relief displacement; Properties of vertical and oblique aerial photographs; Elements of photo and image interpretations; Interpretations keys. Satellites: General Orbital characteristics; Principal scale and scale factor; sensor characteristics. Remote Sensing Regions and bands. Spectra of common natural objects – soil, rock, water and vegetation; Concepts of radiometric, spectral, spatial and temporal resolutions of satellite sensors.

Unit II: Digital Image Processing. Concept of GIS: Definition and components of GIS; Object based and field-based GIS data model; Raster, vector, Spatial and non-spatial data structures; Data Based Management Systems and Model; Spatial Analysis: Spatial elements and analysis, local, focal, zonal and global operations; GIS query and output, Digital Elevation Model (DEM) and its derivatives; Utility of GIS.

Application form for Registration for Open Courses under CBCS

M.Sc. Geology – III Semester

(To be submitted in triplicate for each Open Course applied for)

Copy 1: to be submitted to Head, Parent Department

Copy 2: to Department where student is applying for Open Course

Copy 3: to be forwarded by HOD to Office of the Controller of Examinations, NEHU

1. Name of Student: _____
2. Name of Department/Centre: _____
3. Roll Number: _____
4. NEHU Registration Number: _____
5. Name / Number of Open Course applied for:
 - a.
 - b.
 - c.
6. Department offering Open Course
 - a.
 - b.
 - c.

Signature of Student

Signature of Student Advisor

Signature of Head of the Department with seal

Accepted Not Accepted

Signature of Head of the Department / Centre
servicing the Open Course
(hodgeology@nehu.ac.in)

Signature of Dean of School