

- ✓ Major epidemic and pandemic diseases file:///C:/Users/User/Downloads/12-EPIDEMIC-HR.pdf  
 | Noncommunicable diseases & Communicable diseases <https://www.who.int/our-work/communicable-and-noncommunicable-diseases-and-mental-health>
- ✓ Kaushik. A.D. (2012) Flood Risk Mitigation and Management: A Training of Trainers Module, NIDM: New Delhi.

## 6. Summer Vocational Course

*(Students may opt for vocational courses after 2<sup>nd</sup> Semester and 4<sup>th</sup> Semester for Certificate Course or Diploma Course respectively with 4 credit each)*

**02 Selected Subjects from the Summer Vocational courses:**

1.	<b>Geological Mapping and Cartography</b>
2.	<b>Exportation Geochemistry</b>

### Geological Mapping and Cartography Course

#### Objective:

- To be taught for the 1-year certificate program
- To introduce elements of Geological Maps and its components
- To interpret landforms on geological Maps
- To explain how geological features are represented in a geological map
- To use tools for preparing geological maps

#### Learning Outcome:

- Describe the elements of a geological map
- Explain the significance of symbols and legend items
- Field data Collection, sampling and representation in a geological map
- Prepare a geological map
- Use a geological map for field mapping

#### Unit - I: Introduction:

Geological Map and map components, Scale and symbology, Toposheet numbering, map reading and locating self in field,

#### Unit - II: Field Measurements:

Geological compass and field measurements, Measuring dip and strike, Mapping and representation of lithological contacts, Concept of V-rule and its significance

#### Unit - III: Mapping of Structures:

Folds and Faults and their mapping. Representation of different types of folds and faults. Unconformities and their representation. Techniques of litho-sections Unit - IV: GIS Cartography GIS and Maps, Projection and scale, Map elements – Layout design, north arrow, representative ratio, symbology and legend. Map printing

#### Unit 4: Project Work and Presentation:

Conducting a mini-project on geological mapping of a selected area, Fieldwork to gather data and prepare a geological map, Preparing a report on the mapping project, Presenting findings to the class, including a discussion of the challenges faced and solutions implemented.

**Text Book:**

C W Hayes Handbook for Field Geologists

Maltair & Maltair, 20189, Concepts of Cartography, Remote Sensing & GIS

**Suggested readings:** Compton, R. R., 1985, Geology in the Field, Wiley, New York.

Lisle, Braham, Barnes, 2011, Basic Geological mapping

## **Exploration Geochemistry**

**Course Objective:**

- To be taught for the Diploma Certificate program
- To introduce sampling techniques in practice
- To explain how field data is collected, stored and sample prepared for analysis
- To learn about geochemical assay and their tabulation
- To use basic statistical tools for QA/QC and generate plots

**Learning Outcome:**

- Able to collect samples and record them
- Able to prepare samples for analysis
- Explore geochemical assay data and perform QA/QC using statistical tools
- Interpret statistical data and generate plots

**Unit - I: Introduction**

Qualitative vs Quantitative Geochemical analysis, Dry and wet tests, Water and Soil sample analysis, Sample preparation and digestion methods.

**Unit - II: Rock (& Mineral) Analysis**

Estimation of Oxides by Gravimetry, EDTA and photometry. Wilson's Method and Volhard's method

**Unit - III: Ore Analysis**

Estimation of antimony, arsenic cobalt, chromite, manganese iron, magnesium, molybdenum and Nickel ore

**Unit - IV: Assay QA/AC and Plots**

Quality control of Assay data, Statistical parameters for error analysis. Using geochemical data – organizing, checking integrity, plotting. Bivariate plots, ternary plots, Elemental ratio plots

**Text Book:**

R N Hota, 2019 Geochemical Analysis, CBS Publications

Rollison and Pease, 1993, Using Geochemical Data, Cambridge University Press

Levinson, A. A. (1980). *Introduction to Exploration Geochemistry*. Applied Publishing Ltd.

Rose, A. W., Hawkes, H. E., & Webb, J. S. (1979). *Geochemistry in Mineral Exploration*. Academic Press.

Govett, G. J. S. (1983). *Handbook of Exploration Geochemistry*. Elsevier.

**Suggested Readings:**

Butt, C. R. M., & Zeegers, H. (1992). *Regolith Exploration Geochemistry in Tropical and Subtropical Terrains*. Elsevier.

Hale, M. (2000). *Geochemical Remote Sensing of the Subsurface*. Pergamon.

Marjoribanks, R. (2010). *Geological Methods in Mineral Exploration and Mining*. Springer.

Chork, C., & Clark, I. (1999). *Practical Geostatistics*. Ecosse North America Llc.

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