



# Introduction to Mineral Exploration & Mining

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# Course Management & Delivery:

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- ❖ Google Classroom (Attendance, Lecture Notes, PPT's, PDF's, Assignments, Quizzes & May be exams also?)
  
- ❖ Google Meet: Adopting the flipped classroom approach

# Objectives & Outcomes:

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The course is aimed to give idea about mineral exploration techniques and basic concept of mining. The learner will be able to appreciate the procedure and principles of exploration and will be able to understand different ways to approach the potential areas for evaluating the deposits. The learner will also be able to assess suitability of various tools available for mineral exploration in any potential area.

# Syllabus

## Paper-II: GEOEXPLORATION AND PRINCIPLES OF MINING

Time: 3 hrs

MM 50

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### UNIT-I

Geological techniques and procedures of exploration stages, planning and operation of exploration. Procedure for obtaining a mining lease.

### UNIT-II

Geological aspects of drilling: drilling methods, selection of sites, angles and direction of bore holes. Core-logging.

### UNIT-III

Methods of sampling, weighing of samples and calculation of average grades. Classification of ore reserves, calculation of cut-off grade. Grade and tonnage. Principles of geochemical and geophysical prospecting.

### UNIT-IV

Mineral Economics and its concept, tenor, grade and specifications for important minerals used in industries. Methods of ore reserve estimation. Principles and methods of ore dressing.

### UNIT-V

Introduction to remote sensing. Elements of mining methods: Introduction to open cast and underground mining methods.

# Unit Wise Insights

## UNIT-I

Geological techniques and procedures of exploration stages, planning and operation of exploration. Procedure for obtaining a mining lease.

- Exploration Stages
- Rules
- Policies
- Planning of Exploration
- Mining Lease

# Unit Wise Insights

## UNIT-II

Geological aspects of drilling: drilling methods, selection of sites, angles and direction of bore holes. Core-logging.

- Drilling
- Types of drilling
- Suitability of drill types
- Site selection
- Angles and direction of bore holes
- Core logging

# Unit Wise Insights

## UNIT-III

Methods of sampling, weighing of samples and calculation of average grades.

Classification of ore reserves, calculation of cut-off grade. Grade and tonnage.

Principles of geochemical and geophysical prospecting.

- Sampling
- Average Grades
- Ore Reserve Estimation
- Cutoff Grades
- Grade & Tonnage relationship
- Geophysical Exploration
- Geochemical Exploration

# Unit Wise Insights

## UNIT-IV

Mineral Economics and its concept, tenor, grade and specifications for important minerals used in industries. Methods of ore reserve estimation. Principles and methods of ore dressing.

- Mineral Economics
- Specifications of important minerals
- Ore Reserve Estimation
- Ore Dressing
- Bulk Analyses

# Unit Wise Insights

## UNIT-V

Introduction to remote sensing. Elements of mining methods: Introduction to open cast and underground mining methods.

- Remote Sensing
- Elements of Mining
- Open Cast Mining
- Underground Mining

# Some Basics:

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- Ore
- Gangue
- Tenore
- Metallic Minerals
- Non Metallic Minerals

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Any Questions??

Thank You !!!

