

**INSTITUTE OF HYDROCARBON, ENERGY AND GEO-RESOURCES**  
**ONGC CENTER FOR ADVANCED STUDIES, UNIVERSITY OF LUCKNOW**

**Name of the Program: P.G. Diploma in Exploration, Resources and Mining Technology**

**ABOUT THE PROGRAM:**

The Institute of Hydrocarbon, Energy and Geo-Resources, ONGC Center for Advanced Studies is organizing one-year (2-Semester) PG Diploma program in Exploration, Resources & Mining Technology since 2017-18 session, in **collaboration** with a Oman based multinational mining consultancy company- Bedrock Mineral Resource Consulting (BMRC; bmrcgroup.com). It is an academia-industry collaboration program for the benefit of the students, which opened **plethora of job opportunities**, as Resource Geologists, for the Diploma students in National and International mining Industries. For this **International Collaboration**, the University signed a Memorandum of Understanding (MoU) with the BMRC, having offices at UAE, Sultanate of Oman & India.

The Eligibility for Admission in this program is M.Sc. Degree in Geology/ Applied Geology as the students understand important aspects of Earth Science like Field Geology-Mapping, Sedimentology, Structural Geology, Petrology, Mineralogy, Economic Geology, etc. It paved the way an **opportunity of Employability/ Placement** of the Geology students in Mining Industry.

The Aim of initiation of this program is to improve the knowledge and **Application Skills** of Geology students in Mineral Resource Estimation & Mining **Technology** so that students may acquire specialized knowledge to cater the need of Resource Geologists. This Diploma program increases the **employability/** ability of Geology students to gain employment in the field of Mining Industry, in addition to the job in Earth Science.

This one-year full time PG Diploma program has all the salient features of a world class education, delivered using relevant material and teaching resources. Oriented towards preparing geologists for today's world, visiting lecturers from Bedrock Mineral Resource Consulting (BMRC) are guiding the enrolled students through Standard Operating Procedures, Quality Assurance and Quality Control (QAQC), Data Verification, Exploratory Data Assessment, 2D

interpretation, 3D interpretation, and Mineral Resource Estimation, etc. Students also get an opportunity to work on state-of-the-art software like Datamine for Mineral Resource Modeling and open pit design.

The Institute initiated this Diploma program for the first time in the University of Lucknow; the subject is not taught in any other Indian University. This is also the first course in the history of University of Lucknow wherein a foreigner, Mr. Jozef Cisovsky, a native of Slovakia, Chief Geologist BMRC, Oman, taken specialized lectures on Quality Assurance & Quality Control (QAQC), Resource Geology, Datamine etc. continuously for two weeks.

**Expansion of Infrastructure:** In addition to the teaching/ academic activities, online-lecture/ video-conferencing facilities have been setup in the Institute, which helped in professional training to the students. Smart-board (having built-in computer & projector), PowerPoint presentation facilities, Public Address System have also been setup and functional, in addition to small library, full-fledged petrological and computer laboratory.

#### **PROGRAM OBJECTIVES:**

1. To improve the knowledge and application skills of Geology students in Mineral Resource Estimation & Mining Technology to meet out the need of Industrial requirement in National & International Exploration and Mining Industry.
2. To train and up-grade the skills of students in **application** of mining software, like Datamine, ArcGIS etc., used in Exploration, Resource estimation and mine planning design.

#### **PROGRAM OUTCOME:**

Within one year, the first semester focused training of mining tools Operating Procedures, Quality Assurance and Quality Control (QAQC), Data Verification, Exploratory Data Assessment, 2D interpretation, 3D interpretation, and Mineral Resource Estimation. In second semester, Students gets opportunity to work on real mining project & industrial visit. Students learn various aspect of industrial working system. Each student does the project assignment on specific topic at BMRC.

## **PROGRAM SPECIFIC OUTCOME:**

Two batches of this Diploma program have passed out and the job placement was 80%.

A pool of committed BMRC consultants along with visiting professionals/ guest faculties helped the participating students develop in-**Depth & Interdisciplinary Understanding**/ relevant skills and qualities, along with functional competencies essential to the Mining World. The participants are being groomed to develop decision making and problem-solving skills by leveraging appropriate course content and teaching and learning methods so that they may do **Excellence in specific areas**. The paper – 5 (Practical/ Dissertation Report) in each semester is planned in such a way to **Improving Practical and Theoretical knowledge** of the students and their **Organizational skills**.

## **COURSE OUTCOME, SEMESTER I**

### **PGD-11: Mining Operations:**

This paper emphasizes on how the mining operations will be done. Like for any mine develop the things are interlinked with each other like prospecting the area for ore, development & planning of the mine, Extraction and closure/reclamation of the mine. After that the role of the geologist for grade control in mine, safety in mines, environmental management in mines, role of hydrogeologist in mining operations. These will help students to understand various mining operations in the mines and how it is implemented in the operation of the mine; i.e. decision making aspects.

### **PGD-12: Exploration Technology**

This paper will help the students like how the exploration of any ore deposit will be done. Planning and management of mineral exploration, and other helpful techniques in mineral exploration, the role of geophysics in discovering the potential areas, drilling, etc.

### **PGD-13: Exploratory Data Assessment**

This paper helps to handle the exploratory data management and their statistical analysis, cross verification, and validation. Graphs representation, quality assurance, and quality control which is very essential for reliability of data, sampling, etc.

#### **PGD-14: Introduction to Mineral Resource Estimation**

This paper helps in interpretation of the ore deposits in the form of 2D interpretation, 3D interpretation and block modelling of the ore deposit. It will help in understanding the calculation of the tonnage for any ore deposits. Techniques of Mineral resource estimation process and validation helps to improve the basic knowledge of reporting.

#### **PGD-15: PRACTICAL**

Practical involves understanding the software's which is now currently used in mining sectors. Mineral resource and mine design in Datamine software, ArcGIS software role in mapping, exploratory data management software etc.

### **COURSE OUTCOME, SEMESTER II**

#### **PGD-21: Mining Methods**

This paper involves understanding the different mining methods which are used in extraction of the ore deposits, drilling blasting, underground mine designing, and surface mining design. Operations involved, in different mining methods, the impact of mining on the environment and their remedial, etc.

#### **PGD-22: Introduction to Mine Planning and Financial Modelling**

This paper gives an idea about the elements of the mine planning, project economics, financial modeling for the run of mine from exploration to up to the closure of the mine, etc.

#### **PGD-23: International Standards and Compliance**

This paper involves understanding the global technical reporting standards for different regions of the world. Like JORC reporting its significance and classification of Resource and reserve., NI43-101 reporting standards and their significance, UNFC classification, and Indian regulatory requirement.

**PGD-24: Mining Studies**

This paper gives an idea about the role of mining studies, preliminary economic assessment, and their limitation, the pre-feasibility study of ore deposits, mining, etc., the importance of bulk sampling and beneficiation processes and their study.

**PGD-25: PRACTICAL/ DISSERTATION REPORT**

This practical involves understanding the processes of from discovery of mineral deposits up to the mine development and extraction of ore. Giving useful dissertation to understand the different types of commodities and their exploration techniques and exploitation, etc.