



In Partnership With Diversity Learning Institute-DLI & Twikatane e.V Vermany

Master's Degree Course: General Mining Management, M.Sc. GMM
 Course Duration: 12 months(1 year) 2 semesters(Total Credits = 60)

(A) Modules Outline

Module Name	Module Code	Teaching Hours	Credits
Semester 1 Modules			
Introduction to Mining Engineering	GMM 601	30 hours	10
- Mining Industry Overview	-	10 hours	-
- Mining Methods and Techniques	-	10 hours	-
- Mining Safety and Environmental Aspects	-	10 hours	-
Mineral Exploration and Resource Estimation	GMM 603	30 hours	10
- Geological Survey Techniques	-	10 hours	-
- Geophysical Exploration Methods	-	10 hours	-
- Resource Estimation Techniques	-	10 hours	-
Mining Operations and Technology	GMM 605	30 hours	10
- Mine Planning and Design	-	10 hours	-
- Surface and Underground Mining Methods	-	10 hours	-
- Mining Equipment and Automation	-	10 hours	-
Semester 2 Modules			
Mine Safety and Environmental Management	GMM 602	30 hours	10
- Safety Regulations and Compliance	-	10 hours	-
- Environmental Impact Assessment	-	10 hours	-
- Emergency Response Planning	-	10 hours	-
Mineral Processing and Metallurgy	GMM 604	30 hours	10
- Ore Crushing and Grinding	-	10 hours	-
- Extractive Metallurgy Processes	-	10 hours	-
- Mineral Separation Techniques	-	10 hours	-
Mining Economics and Project Management	GMM 606	30 hours	10
- Financial Evaluation of Mining Projects	-	10 hours	-
- Project Planning and Execution	-	10 hours	-
- Risk Analysis in Mining Operations	-	10 hours	-

(B) How Artificial Intelligence (AI) Can Be Applied in This Course:

1. Predictive Maintenance in Mining:

- Implementing AI for predictive maintenance of mining equipment, optimizing operational efficiency, and reducing downtime.

2. Autonomous Mining Operations:

- Integrating AI technologies for autonomous mining operations, including autonomous haulage systems and drilling rigs, to enhance safety and productivity.

3. Smart Monitoring and Control Systems:

- Utilizing AI in smart monitoring and control systems for real-time data analysis, equipment optimization, and environmental monitoring in mining operations.

4. Geological Data Analysis:

- Applying AI algorithms to analyze geological and geophysical data for more accurate mineral exploration, resource estimation, and target identification.

5. Environmental Impact Assessment with AI:

- Implementing AI in environmental impact assessments for mining projects to analyze potential ecological consequences and develop sustainable mitigation strategies.

6. Financial Modeling and Risk Analysis:

- Using AI for financial modeling, risk analysis, and decision support in mining economics and project management, optimizing financial outcomes and minimizing risks.

By incorporating AI into the General Mining Management course, students can explore how advanced technologies can transform the mining industry, making it safer, more efficient, and environmentally sustainable.