National Institute of Technology Rourkela

Registration Seminar

Seminar Title	: Mine Production Scheduling and Supply Chain Optimization using Mathematical Model and Heuristics.
Speaker	: Tapan Dey (Rollno : 922mn5007)
Supervisor	: Amit Kumar Gorai
Venue	: Seminar Hall (Department of Mining Engineering)
Date and Time	: 13 May 2025 (11.00 AM)
Abstract	: Long-term and short-term mine planning and production scheduling are needed for efficient and economic mining. Additionally, the supply chain of materials from mines to the consumer end also plays an important role in mine&rsquos profitability. Moreover, the environmental impacts of mining need to be considered for effective mine planning due to regulatory constraints. The proposed study will attempt to design and develop the optimization model for short-term and long-term iron ore mine planning and production scheduling by considering the supply chain of materials and environmental factors. The study will also forecast the national/global level steel demand and market price. Further research on the selection of suitable equipments and analyzing the necessary constraints to be incorporated during planning and scheduling. There is a need to develop an integrated optimization model on mine production planning, supply chain from multiple mines to multiple consumers, and environmental constraints to achieve a better outcome. The research gaps are identified in this area based on the multiple literature reviews, and the research objectives are summarized accordingly. Steel demand forecasting models are developed using time series and machine learning models, and the results are summarized. A mathematical model is developed to minimize the total cost of the network from mines to steel plants. The mine-to-plant supply chain model needs to be enhanced with additional constraints like inventory, supply, demand uncertainty, emissions, etc. This also needs to be integrated with the mine production scheduling. This mathematical model will be executed in an optimization tool like Python.