



# Mining Industry in Jharkhand

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CLASS XI

# Jharkhand

THE MINING BASE OF INDIA



# Jharkhand

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## Jharkhand Factfile



Source: Maps of India

- Jharkhand is located in the Eastern part of India. The state shares its border with West Bengal in the East, Uttar Pradesh and Chhattisgarh in the West, Bihar in the North and Odisha in the South.
- Commonly spoken languages of the state are Hindi and Santhali. Urdu and Bengali are also prevalent. English is the primary medium of education.
- Forests and woodlands occupy more than 29% of the state.

- Jamshedpur, Dhanbad, Bokaro, Deoghar and Hazaribagh are some of the major cities and industrial areas in the state.
- Jharkhand has around 40 per cent of the country's mineral resources such as coal, iron ore, copper, uranium, mica, bauxite, granite, limestone, silver, graphite, magnetite and dolomite.

Parameters	Jharkhand
Capital	Ranchi
Geographical area (sq km)	79,714
Administrative districts (No)	24
Population density (persons per sq km)*	414
Total population (million)*	32.9
Male population (million)*	16.9
Female population (million)*	16.0
Sex ratio (females per 1,000 males)*	947
Literacy rate (%)*	67.6

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# Economic parameters of Mining in Jharkhand

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- I. Jharkhand is located in the eastern part of India. In India, Jharkhand is one of the leading states in terms of economic growth. At current prices, Jharkhand's gross state domestic product (GSDP) stood at Rs. 3.63 trillion (US\$ 48.63 billion) in 2021 - 22.
  - II. Jharkhand is one of the richest mineral zones in the world and boasts of 40% and 29% of India's mineral and coal reserves, respectively. Due to its large mineral reserves, mining and mineral extraction are the major industries in the state.
  - III. Mineral production (excluding fuel minerals, atomic minerals and minor minerals) in the state stood at Rs. 10,172.47 crore (US\$ 1.38 billion) until January 2021.
  - IV. Jharkhand is rich in mineral resources such as coal (27.3% of India's reserves), iron ore (26% of India's reserves), copper ore (18.5% of India's reserves), uranium, mica, bauxite, granite, limestone, silver, graphite, magnetite and dolomite. Jharkhand is the only state in India to produce coking coal, uranium, and pyrite. With 25.7% of the total iron ore (hematite) reserves, Jharkhand ranks second among the states.

# Jharkhand

THE MINING BASE OF INDIA

## Advantage Jharkhand

### Endowed With Extensive Mineral Reserves

Jharkhand has around 40 per cent of the country's mineral wealth. The state is one of the largest producers of coal, mica and copper in India. Because of its large mineral reserves, mining and mineral extraction is the major industry in the state.

### Policy And Fiscal Incentives

Jharkhand offers a wide range of fiscal and policy incentives to the industries, under the Industrial Policy, 2012. The state also has policies for IT and SEZ offering sector-specific incentives.

### High Economic Growth

The average GSDP growth rate was about 9.4 per cent between 2004-05 and 2011-12. The state provides investment opportunities in sectors such as mining and metal, power, infrastructure, manufacturing and food processing.

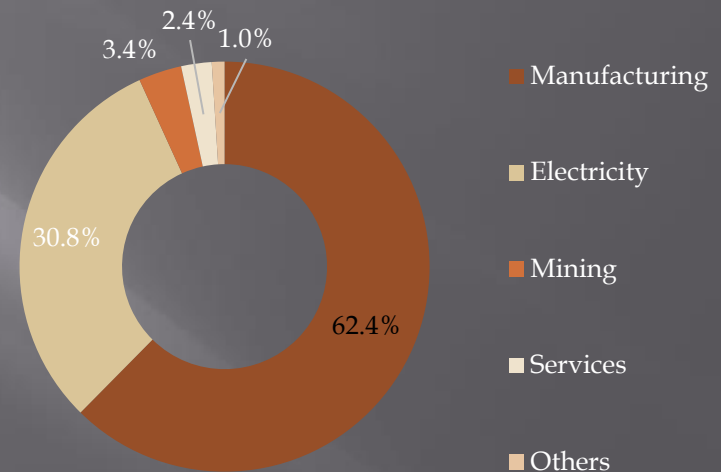
### Location Advantage

The state's industries enjoy a unique location-specific advantage as it is close to the vast market of Eastern India; it is closer to the ports of Kolkata, Haldia and Paradip and has easy access to raw materials.

## Economic Snapshot – Investments

- In 2011-12, the total outstanding investments in Jharkhand were US\$ 615.1 billion.
- Of the total outstanding investments, the manufacturing sector accounted for around 62.4 per cent followed by electricity sector at 30.8%.

Break up of Outstanding Investments by Sector (2011-12)



# Jharkhand

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## Key Industries

- The natural resources, policy incentives and location-specific advantages of Jharkhand support investments in sectors such as mining and metal extraction, engineering, iron and steel, and chemicals.
- Since Jharkhand has around 40 per cent of the country's mineral wealth, its extensive mineral resources make mining, metals and related sectors, a naturally strong sector of the state.

### Key Industries in Jharkhand

- Mining and Mineral Extraction
- Engineering
- Iron and Steel
- Chemicals
- Handloom
- Food and Beverages
- Plastics and Rubber
- Printing and Packaging
- Tourism
- Automotive
- Cement

### Major Minerals of Jharkhand

- Coal
- Iron Ore
- Copper
- Aluminium
- Graphite
- Mica
- Manganese
- Uranium

# Jharkhand

THE MINING BASE OF INDIA

## Key Industries – Mining and Metals Industry ... (1/2)

- Jharkhand is a mineral-rich state; about 40 per cent of India's mineral reserves are available in the state.
- Mining and quarrying sector contributed around 10.9 per cent to the state's GSDP in 2011-12. It supports downstream industries and thermal power generation.
- Jharkhand's mineral reserves include coal, iron ore, bauxite, copper, mica, graphite, manganese, lead, silver, uranium and limestone.
- The Central Mine Planning and Design Institute, Central Institute of Mining & Fuel Research and Indian School of Mines are located in Dhanbad and National Metallurgical Laboratories is located in Jamshedpur.

### Some of the Key Players

- Tata Steel Ltd.
- Jindal Steel & Power Ltd.
- Hindalco Industries Ltd. (HIL)
- Steel Authority of India Ltd. (SAIL)

Key Minerals	Districts
Coal	Dhanbad, Bokaro, Hazaribagh, Chatra
Iron Ore	West Singhbhum, Palamau
Bauxite	Lohardaga, Gumla, Palamau, Ranchi
Copper	East Singhbhum, Dumka
Mica	Dhanbad, Koderma, Giridih, Hazaribagh
Graphite	Garhwa, Palamau
Manganese	West Singhbhum, Palamau
Quartz (silica sand)	Singhbhum, Dumka, Hazaribag, Deogarh, Palamu, Sahidganj



# Major Companies in mining sector at Jharkhand

- I. CENTRAL COALFIELDS LIMITED
- II. BHARAT COKING COAL LIMITED
- III. ABREAST ENGINEERING COMPANY
- IV. DHANSAR ENGINEERING COMPANY
- V. KINSHIPTRADE PRIVATE LIMITED
- VI. SUPREME STONE WORKS
- VII. TENUGHAT EMTA COAL MINES LIMITED

## Key Industries – Mining and Metals Industry

### Tata Steel Ltd



- Established in 1907, Tata Steel is the world's sixth largest steel manufacturer. In 2010-11, the company produced 6.69 million tonnes of saleable steel.
- The company is setting up a 12 Million Tonnes Per Annum (MTPA) greenfield integrated steel plant in the state at Seraikela. It has captive raw material resources and a state-of-the-art plant in Jamshedpur with a capacity of 6.8 MTPA.

### Jindal Steel & Power Ltd (JSPL)



- JSPL is a leading player in steel, power, mining, oil and gas and infrastructure, with an annual turnover of around US\$ 3.78 billion.
- The company is setting up a 12 MTPA integrated steel plant and a 2,820 MW captive power plant in the state, with a total investment of US\$ 12 billion. The first phase of 3 MTPA steel plant at Patratu near Ranchi is expected to be commissioned by 2014.

### Hindalco Industries Ltd (HIL)



- HIL, a part of the Aditya Birla Group, is the world's largest aluminium rolling company and one of the biggest producers of primary aluminium in Asia.
- Hindalco's alumina refinery with 450,000 TPA capacity is located at Muri. It has the distinction of being the first alumina refinery in India . The company also has a 30 mega watt coal-based captive power plant.

### Steel Authority of India Ltd (SAIL)



- SAIL is one of the leading steel-making companies in India. It is owned by the Government of India. The company operates a steel plant at Bokaro in Jharkhand.
- SAIL has a well-equipped Research and Development Centre for Iron and Steel (RDCIS) as well as an in-house centre for engineering and technology, a management training institute and a safety organisation at Ranchi.

# Career Opportunities in Mining Sector

- Trades Assistant
- Skilled or non-skilled labouring
- Site Supervisor / Foreman
- Shot Firers
- Crane Operators
- Mine Supervisors
- Geologists

# Career Opportunities in Mining Sector

- ▣ Mining & Mineral Engineers
- ▣ Geological Engineers
- ▣ Metallurgical Engineers
- ▣ Drill & Blast Engineers
- ▣ Geological Technician
- ▣ Borer Operator
- ▣ Mine Safety Inspector
- ▣ Conveyor Operator
- ▣ Explosives Handlers & Packer
- ▣ Extraction Workers
- ▣ Excavator Operator
- ▣ Mining Engineering Technicians
- ▣ Research Engineers- Data Mining
- ▣ Deputy Chief Mechanical – Metals & Mining
- ▣ Assistant Mining Engineer
- ▣ Mining Engineer / Mine Planner
- ▣ Technical Consultant- Mining Industries



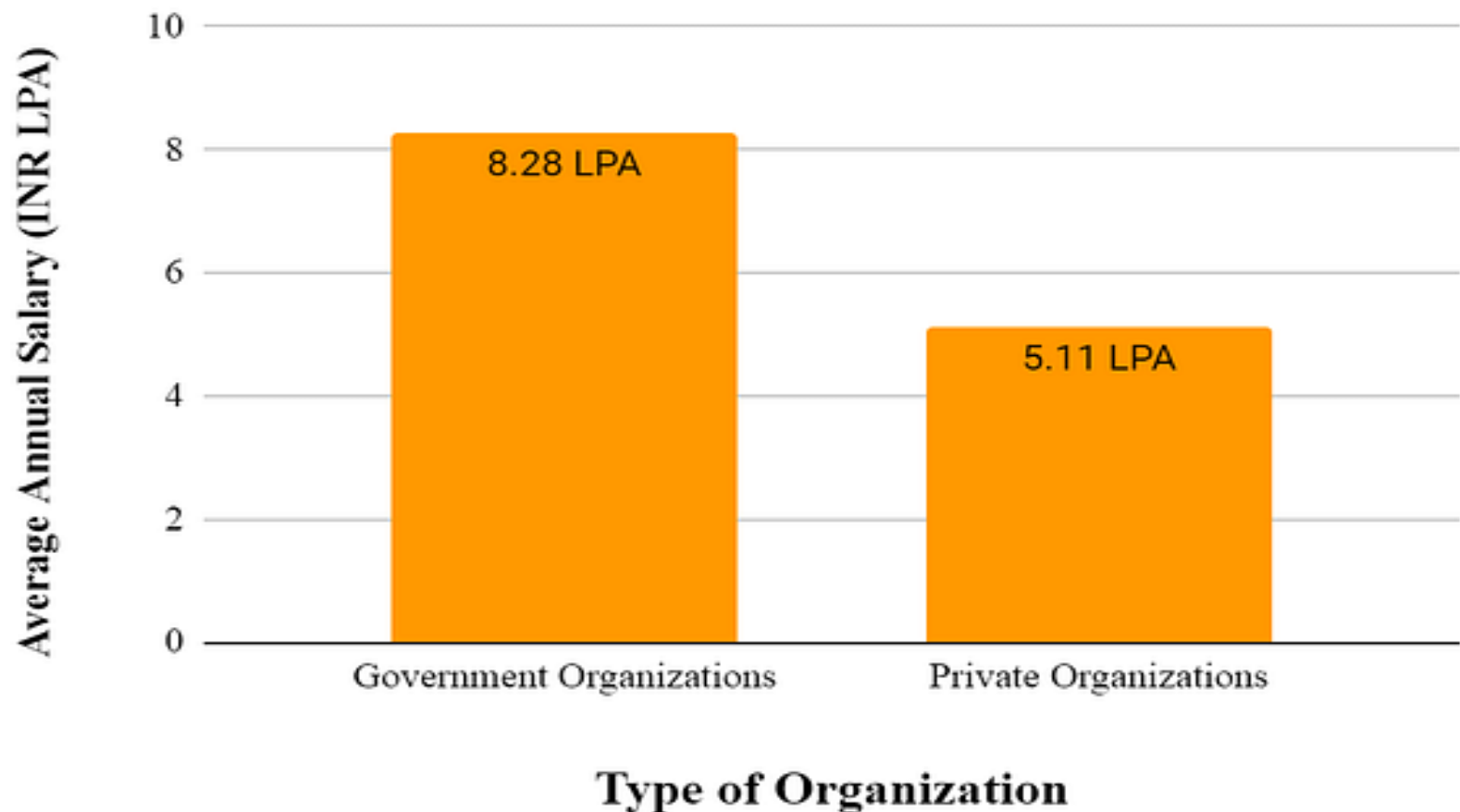
# Salary Packages in Mining Sector

Post	Salary per Month(in Rs)
▣ Director	66330-108330
▣ Joint Director	52590-103290
▣ Deputy Director(M&G)	46060-98440
▣ Deputy Director(Chemist)	46060-98440
▣ Deputy Director(Admin)	46060-98440
▣ Deputy Director(Law)	46060-98440
▣ Assistant Director(M&G)	37100-91450
▣ Assistant Director(Admin)	37100-91450
▣ Assistant Director(Mines)	37100-91450
▣ Assistant Director(Survey)	37100-91450
▣ Assistant Director(Law)	37100-91450
▣ Chemist	37100-91450

# Salary & Pay scale

- ▣ As compared to other professions, mining engineers earn the more remuneration in India. They will get the lucrative pay in the field of mining engineering. In India, they will receive an average salary of 6 to 8 lacs per year. Your salary will also depend on your skills and experience, location and the organization you are working for. In US, the mean yearly salary of mining engineers is \$90,070.

## Average Annual Salary of a Mining Engineer



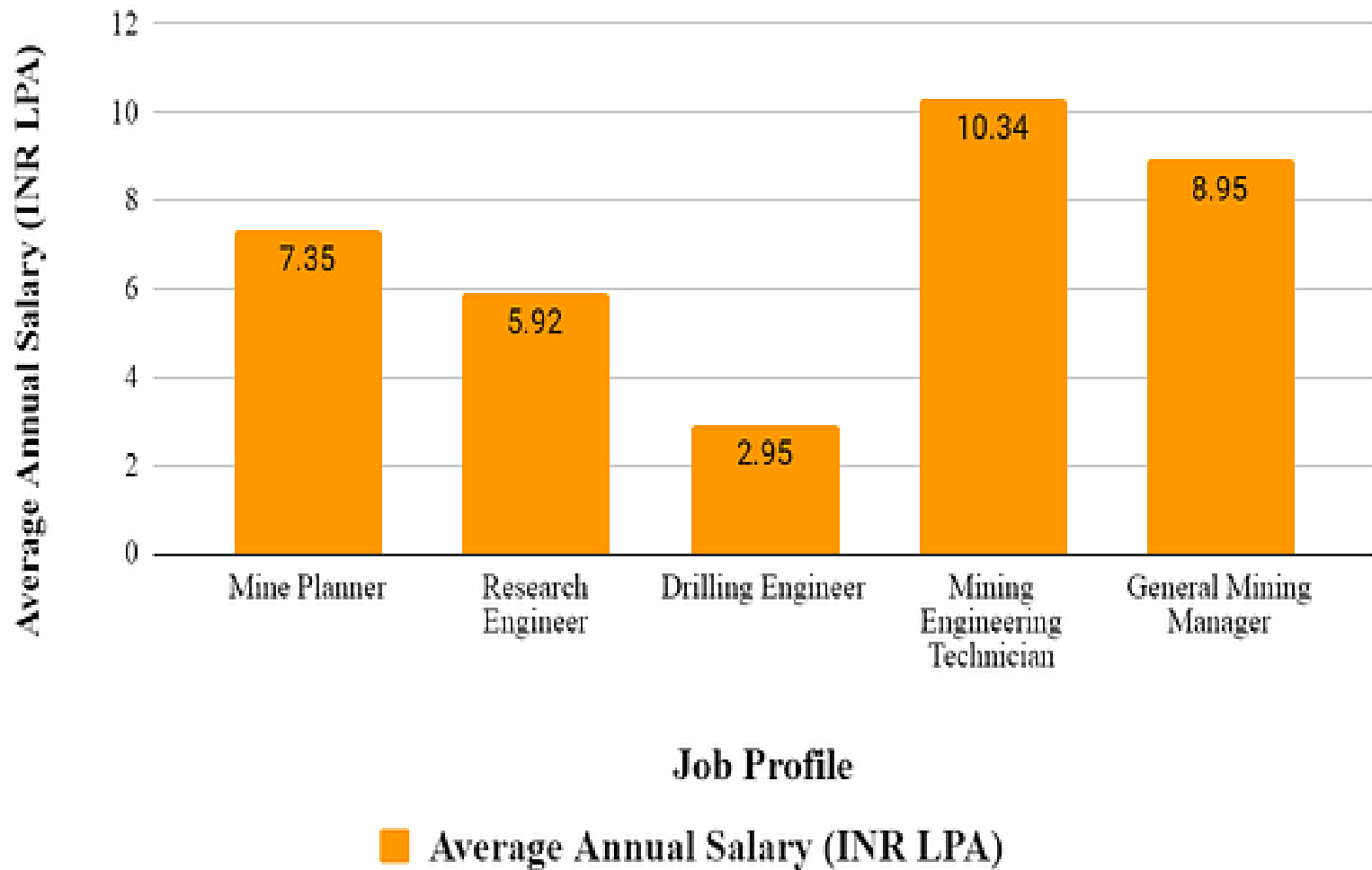
■ Average Annual Salary (INR LPA)

# Specialization-wise

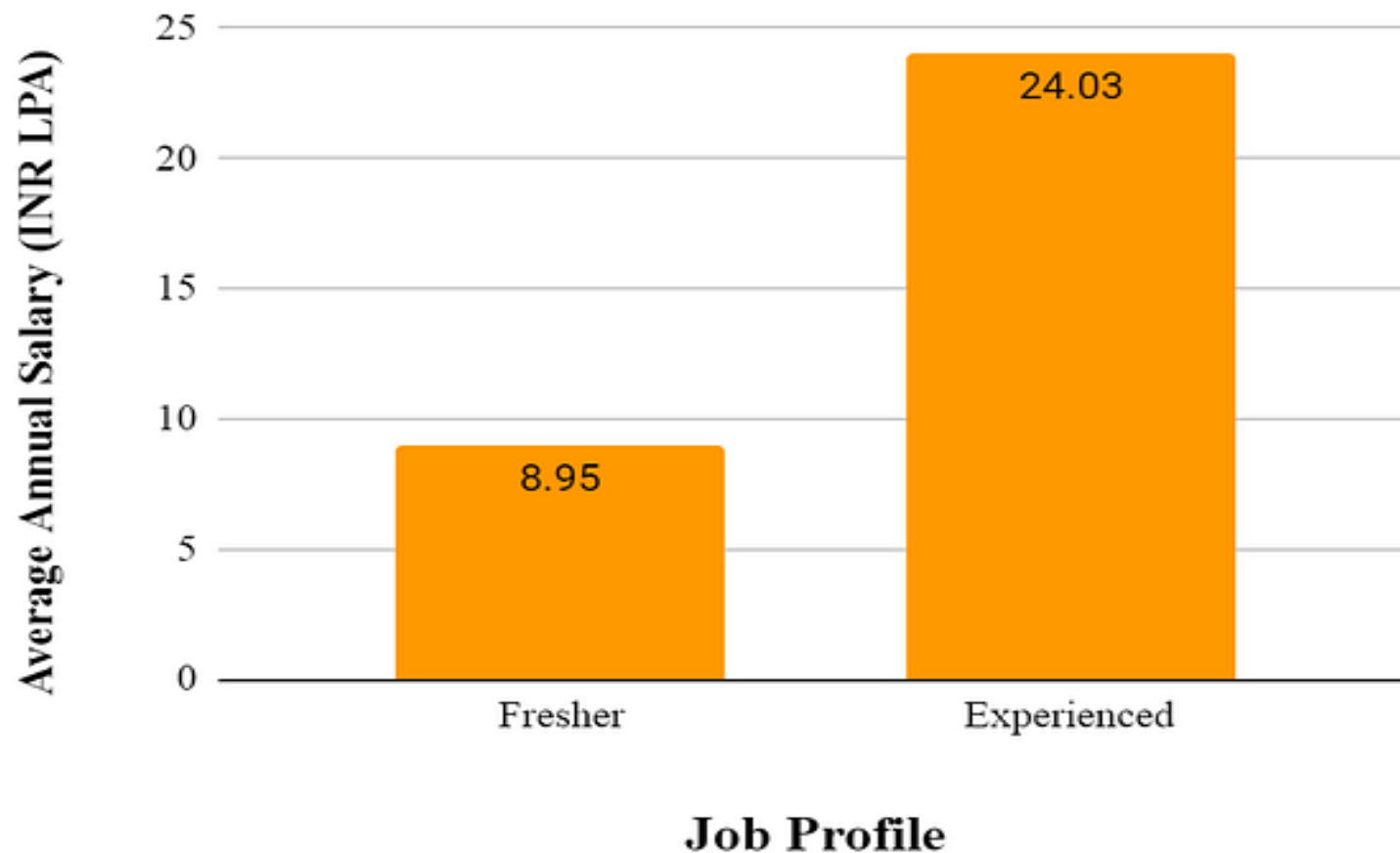
Specializations	Average Annual Salary
Mine Planner	INR 7,35,383
Research Engineer	INR 5,92,756
Drilling Engineer	INR 2,95,351
Mining Engineering Technician	INR 10,34,709
General Mining Manager	INR 8,95,000



## Average Annual Salary vs Job Profiles



## Average Annual Salary vs Experience



■ Average Annual Salary (INR LPA)

# Skills required for jobs in Mining Sector

## ▣ Key skills for mining engineers

- ▣ confidence
- ▣ problem-solving and analytical skills
- ▣ organisation and efficiency
- ▣ Independence
- ▣ Mine planning
- ▣ Project management
- ▣ Msha or Mine safety

## ▣ To become a miner, you would need:

- ▣ excellent physical stamina
- ▣ practical and mechanical skills
- ▣ a thorough knowledge of health and safety regulations
- ▣ teamwork skills

## ▣ Skills for Trade Assistant

- ▣ Strong initiative
- ▣ Willingness to work hard
- ▣ Attention to detail
- ▣ Good communication skills
- ▣ Ability to work in a team
- ▣ Engineering Support

# School Subjects related to mining

- ▣ **Physics** is one of the subjects that are **directly related to engineering and science**. It is also an important subject for mining and mining technology students because it **helps them understand the nature of earth materials used to extract minerals** from the earth
- ▣ **Geography** tells about distribution of resource in various parts of the world. **Geographers** have long examined mining activities, primarily by focusing on the **distribution of resources**, the expansion of mining activities, the development of **technologies to extract elements**, and the **environmental and social impacts** of mining operations.



# Extracurricular Activities connecting with Mining

- ▣ Various project work are given in school or fun activities are conducted in subjects like Geography, Chemistry and Physics.  
Few of them are
  - to identify minerals, their physical properties, and uses.
  - issues concerning the global demand and supply of mineral resources, particularly those that are critical for emerging technologies in energy efficiency and renewable energy.
  - to describe the major steps that a company must follow from initial discovery of a mineral deposit through consumption of a finished mineral product.
  - Time Travel Activity(Take a journey through the history of planet Earth! Introduce your class to the geologic time scale and with some tape and sidewalk chalk)
  - **Rocking the Class with the Rock Cycle.**
  - **Under the Earth-PPT**
  - career opportunities in the mining industry.
  - Density (Students will measure and compare the densities of minerals.)

# Courses offered for Mining careers

- ▣ **BSc in Mining Engineering is a six-semester course:**

B.Sc. in the field of mining engineering focuses on the theoretical and research part of the subject. Students learn how to use various technical equipment that can help them better identify the properties of minerals.

- ▣ **BTech in Mining Engineering is an eight-semester course:**

The course is focused on the practical study of mining engineering. The students learn to deal with the methods used for the extraction and identification of minerals from the ground. Scope across the World: Countries like India, China, and Australia have an expanding mining industry with the ever-increasing production of gold and other minerals. In India, National Mining and Development, HCL, ONGC, TISCO, and TELCO are some of the companies that are leading in the field of mining.

- ▣ **Mining Engineering Syllabus in NITs:**

The programme offered by the National Institute of Technology in Mining Engineering includes many mining and related topics. This help the students understand the physical and chemical properties of minerals, rocks, and soils, and their uses in the construction and manufacturing industry.

- ▣ **Mining Engineering Syllabus in IITs:**

There is a brief course structure offered by the Indian Institutes of Technology (IITs) in Mining Engineering. Along with the core structure, students also have the option of electives, as per the institute's availability.

# Eligibility & Courses

- **Diploma Courses** in Mining and Mine Surveying Engineering – **3 years course**  
**Eligibility Criteria** – Qualifying examination should be 10th/equivalent exam with minimum 50% marks.
- **B.E./B.Tech** in Mining Engineering – **4 Years course**  
**Eligibility Criteria** – Minimum educational qualification of 10+2 from the recognized educational board with at least 50% marks passed with PCM as the compulsory subjects.
- **ME/ M.Tech** in Mining Engineering – **2 Years course**  
**Eligibility Criteria** – After completion of B.E/B.Tech. in the relevant discipline, you are eligible for PG courses.
- **Entrance Exam for UG** – JEE Main
- **Entrance Exam for PG** – GATE

# Mining Engineering

- ▣ The main **subjects that are included** in the course of mining engineering are:
  - Ventilation
  - Rock Mechanics
  - Mine Planning
  - Materials Handling
  - Drilling and Blasting
  - Minerals Processing
  - Ore Reserve Analysis
  - Industrial Management
  - Mine Cost Engineering
  - Mine Health and Safety
  - Environmental Aspects of Mining
  - Design of Engineering Structures



# Admission

- ▣ Aspiring candidates can apply for JEE Main for taking admission in undergraduate engineering courses. To get admission in IITs or NITs, it is must for the candidates to qualify the JEE Advanced examination. For master's courses in engineering, students need to clear the GATE which is conducted once in a year.
- ▣ Apart from these entrance exams, there are many other exams which provides admission to mining engineering. These are as follows:
  - BITSAT (Birla Institute of Technology & Science Admission Test)
  - VITEEE (VIT Engineering Entrance Examination)
  - AP EAMCET (Andhra Pradesh Engineering, Agriculture and Medical Common Entrance Test)
  - TS EAMCET (Telangana Engineering, Agriculture and Medical Common Entrance Test)
  - BCECE (Bihar Combined Entrance Competitive Examination)

# Institutions offering Courses in Mining

- IIT Delhi
- IIT Kharagpur
- IIT Roorkee
- IIT Hyderabad
- IIT Varanasi
- Anna University
- VIT Vellore
- NIT Rourkela
- IIT BHU
- IIT (ISM Dhanbad)
- NIT Rourkela Orissa
- IEST Shibpur, Howrah
- BIT, Chandrapur
- NITK, Surathkal
- Parul University, Vadodara
- Indian Institute of Technology, Guwahati
- Indian Institute of Technology, Mumbai
- Indian Institute of Technology, Kanpur
- National Institute of Technology, Raipur
- National Institute of Technology, Kurukshetra
- Government Engineering College, Gujarat

A circular logo with a white background. The word "College" is written in a blue, serif font. Below it, the words "with Reputation" are written in a smaller, blue, sans-serif font. A magnifying glass icon is positioned over the letter 'o' in "College".

College  
with Reputation

A photograph of two mining engineers, a man and a woman, standing on a dirt path at a mining site. They are both wearing white hard hats and high-visibility orange safety vests over dark clothing. The man is holding a clipboard and pointing towards the background, while the woman also points. In the background, there is a large piece of yellow mining machinery, possibly a truck or excavator, and a pile of dirt.

**BEST MINING ENGINEERING SCHOOLS IN THE WORLD**

2	<a href="#"><u>Curtin University</u></a>	Australia
3	<a href="#"><u>McGill University</u></a>	Canada
4	<a href="#"><u>University of Western Australia (UWA)</u></a>	Australia
5	<a href="#"><u>University of Queensland (UQ)</u></a>	Australia
6	<a href="#"><u>University of New South Wales (UNSW)</u></a>	Australia
7	<a href="#"><u>Queen's University</u></a>	Canada
8	<a href="#"><u>Universidad de Chile</u></a>	Chile
9	<a href="#"><u>University of British Columbia</u></a>	Canada
10	<a href="#"><u>Pennsylvania State University</u></a>	US
11	<a href="#"><u>University of Melbourne</u></a>	Australia
12	<a href="#"><u>University of Alberta</u></a>	Canada
13	<a href="#"><u>University of the Witwatersrand</u></a>	South Africa
14	Camborne School of Mines at the <a href="#"><u>University of Exeter</u></a>	United Kingdom
15	<a href="#"><u>Universidad Nacional Autónoma de México</u></a>	Mexico
16	<a href="#"><u>Technische Universität Bergakademie Freiberg</u></a>	Germany
17	<a href="#"><u>University of Wollongong</u></a>	Australia

Institution	World Rank	Country
<b>Saskatchewan Polytechnic</b>		Canada
<b>University of Southern Queensland (UniSQ)</b>	401	Australia
<b>University of Wollongong</b>	201	Australia
<b>University of Kentucky</b>	<b>501</b>	<b>USA</b>
University of Adelaide	111	Australia
University of Queensland	54	Australia
Federation University Australia	601	Australia
University of Western Australia	132	Australia
UNSW Sydney	70	Australia
Virginia Tech	251	USA
University of Arizona		USA

# Top Mining Engineering Colleges in UK

University Name	Course Name	Course Fee
<a href="#"><u>University of Cambridge</u></a>	Master of Engineering in Mining Engineering	INR 34,63,819
<a href="#"><u>University of Oxford</u></a>	Bachelor of Engineering in Mining Engineering	INR 38,41,178
<a href="#"><u>Imperial College London</u></a>	Bachelor of Applied Science in Mining Engineering	INR 34,56,139
<a href="#"><u>University College London</u></a>	PhD in Mining Engineering	INR 31,95,008
<a href="#"><u>The University of Manchester</u></a>	Master of Engineering in Mining Engineering	INR 24,57,698



# Top Mining Engineering Colleges in the USA

University Name	Course Name	Course Fee
<a href="#"><u>Massachusetts Institute of Technology (MIT)</u></a>	PhD of Engineering in Mining Engineering	INR 39,33,319
<a href="#"><u>Stanford University</u></a>	Bachelor of Engineering in Mining Engineering	INR 38,89,680
<a href="#"><u>University of California</u></a>	Master of Engineering in Mining Engineering	INR 21,89,560
<a href="#"><u>Harvard University</u></a>	Bachelor of Engineering in Mining Engineering	INR 36,53,902
<a href="#"><u>University of Texas</u></a>	Bachelor of Engineering in Mining Engineering	INR 33,39,163

# Top Mining Engineering Colleges in Canada

University Name	Course Name	Course Fee
<a href="#"><u>University of British Columbia</u></a>	Master of Engineering in Mining Engineering	INR 37,50,000
<a href="#"><u>McGill University</u></a>	Bachelor of Engineering in Mining Engineering	INR 38,50,000
<a href="#"><u>Queen's University</u></a>	Bachelor of Applied Science in Mining Engineering	INR 36,70,000
<a href="#"><u>Cambrian College</u></a>	Diploma in Mining Engineering (Technician)	INR 21,70,000
<a href="#"><u>Laurentian University</u></a>	Bachelor of Engineering in Mining Engineering	INR 12,70,000 to 16,70,000

# Top Mining Engineering Colleges in Australia

University Name	Course Name	Course Fee
<a href="#"><u>University Of Melbourne</u></a>	Bachelor of Engineering: Mining (honours)	INR 24,81,000
<a href="#"><u>University Of Queensland</u></a>	Bachelor of Engineering: Mining (honours)	INR 24,46,000
<a href="#"><u>University Of New South Wales</u></a>	PhD in Mining Engineering	INR 26,49,000
<a href="#"><u>University Of Adelaide</u></a>	Master of Engineering: Mining (honours)	INR 24,26,000
<a href="#"><u>Curtin University Of Technology</u></a>	Bachelor of Engineering: Mining (honours)	INR 20,02,000

# Sustainable Development goals in Mining

**7** AFFORDABLE AND CLEAN ENERGY



## SDG 7-Affordable and clean energy

Mining aims to provide good quality coal and at affordable cost providing cheap source of clean energy.

## SDG 8-Decent work and Economic Growth

Mining activities generates good amount of revenue leading to economic growth of surrounding areas.

**8** DECENT WORK AND ECONOMIC GROWTH



**9** INDUSTRY, INNOVATION AND INFRASTRUCTURE



## SDG 9- Industry, Innovation, Infrastructure

Mining industry leads to economical development of the area promoting better infrastructure.

## SDG 12-Responsible consumption and Production

Mining produce should be produced and consumed responsibly to prevent environmental problems

**12** RESPONSIBLE CONSUMPTION AND PRODUCTION



*The Intergovernmental Forum in Mining, Minerals, Metals and Sustainable Development (IGF) supports more than 60 nations committed to leveraging mining for sustainable development to ensure that negative impacts are limited and financial benefits are shared. It is devoted to optimizing the benefits of mining to achieve poverty reduction, inclusive growth, social development and environmental stewardship. The International Institute for Sustainable Development (IISD) has served as Secretariat for the IGF since October 2015. Core funding is provided by the Government of Canada.*

# CCL inks MoU for developing eco-parks in Jharkhand

Central Coalfields Limited (CCL), a Jharkhand-based subsidiary of Coal India Ltd, has signed a Memorandum of Understanding (MoU) with a Public Sector Enterprise WAPCOS Limited for development of nine eco-parks. The parks covering a total area of 126.47 hectares will be developed in Bokaro, Chatra and Hazaribag district of Jharkhand.

The development of the Eco-parks will envisage a sustainable ecosystem by adopting suitable measures like honey bee farming, fish farming, food processing plant and others with a goal for revenue generation to meet the maintenance expenditure. The period of engagement of WAPCOS Limited is 6 years (1 year for the development of Eco park and subsequent five years for maintenance) which contains the last one year as a self-sustainable period. The total cost for the development of 9 Eco-Parks including PMC Charges will be about Rs 63 Crores.

CCL is thus committed to environmental preservation and biodiversity conservation.



## BCCL's vision

BCCL's vision is to produce efficient coal and in an eco-friendly manner. BCCL has kept environmental stewardship as its top most priority with persistent efforts to produce sustainable coal that would pave the path to a vibrant, sustainable and prosperous future of communities and the nation.

**Ecological Restoration:** The objective is to establish a natural forest with biodiversity and to bring back original normalcy of function, structure, potential, service and process of ecosystem as existed prior to mining activity. Hence, ecological restoration of mined out areas is the most appropriate ecologically and socio-economically compatible measure.

**GABION PLANTATION** - Gabion plantation is also being done through State forest Department. A total of 28188 gabion plantation has been done till 2019-20 along the roadside in Dhanbad region. BCCL has also been assessing for adding such plantation in around Dhanbad to make the environment cleaner and greener.

**ECO-PARKS-** Along with establishment of the natural forests over the degraded mined out areas and OB dumps, BCCL has also been developing eco-parks over some degraded mined out areas and OB dumps sites. BCCL has developed eco-parks namely Gokul Eco-cultural Park, Lodna Area; Parasnath Udyaan, Katras Area; GKCC eco-restoration site, Kusunda Area; Panchvati Eco-park, Koyla Nagar & Tetulmari Biodiversity Park, Sijua Area.

# Hindalco

## **Our proactive initiatives include:**

- Choosing the right technology for our greenfield projects to ensure energy efficiency.
- Enhancing material efficiency, process/equipment productivity backed by pollution prevention practices and adoption of cleaner technologies for brownfield projects.
- Waste Management System for systematic collection of scrap and safe storage/disposal and re-use of wastes.
- Continuous efforts to conserve resources, minimise and recycle wastes.
- Controlling emissions through dry scrubbing and electrostatic precipitators and discharge through appropriate effluent treatment plants.
- Rehabilitation through afforestation of mined areas and rehabilitation of waste disposal sites by greening, e.g. fly ash mound and abandoned red mud dump.
- Promoting industrial recycling of waste like spent pot lining, fly ash, spent caustic, etc.

Hindalco Industries Limited, the metals flagship of Aditya Birla Group, has achieved the No.1 rank in the Aluminium Industry for its sustainability performance in the 2021 edition of the S&P Dow Jones Sustainability Indices (DJSI) Corporate Sustainability Assessment (CSA) rankings. Hindalco achieved 100th percentile in most aspects of the 3 dimensions of Environmental, Social and Governance (ESG) including Climate Strategy, Environment and Social reporting, Water-related risks, as well as in operational eco-efficiency parameters such as Waste Management and Resource Consumption, Cybersecurity, Community Engagement and Employee Development. Hindalco's utilization of overall waste had also reached 80% in FY21, an increment of 15 percentage points over the last financial year, in line with the Company's goal to achieve zero-waste to landfill by 2030.

Hindalco has been able to record a 48% reduction in specific freshwater withdrawal by focusing on zero liquid discharge, higher water recycling and efficient water use.

Hindalco has developed a Sustainable Mining Charter alongside with sustainability advisory partner Xynteo, focusing on best environmental practices in water and biodiversity, community livelihood and health, among others.

# TATA STEEL LTD.

**Launched in April 2017, the Green School is an initiative running across all the Tata Steel's operational areas in Jharkhand and Odisha, wherein special attention is given to create a holistic environment where students and teachers learn and rediscover their connection with nature and make concerted efforts to conserve it through resource management initiatives at local levels.**

**The Green School, a joint initiative of Tata Steel Foundation and TERI, participated in the ongoing World Sustainable Development Summit (WSDS)(18<sup>th</sup> Feb 2022) to showcase its work on climate change related issues and the various milestones achieved over the years. Organised under 'WSDS 2022' thematic track titled "Futurists for the Future: A Younger, Greener Collective", the session was attended by the students and teachers of the participating schools apart from the global audience.**

# Jindal Steel & Power becoming net carbon zero by 2035

Jindal Steel & Power Chairman **Naveen Jindal**, in his address to shareholders at the company's Annual Report, said, "We have also aligned with the global decarbonisation drive, setting up an ambitious target of ensuring carbon emissions remain below 2.0 t/tcs by 2030 and becoming net carbon zero by 2035. Embedding sustainability practices in all areas of our operations help us contribute to a greener and cleaner future and create a better world for generations to come."

The Company successfully divested Jindal Power Limited (JPL) on 30 May 2022 to Worldone Private Limited. The divestment will boost the Company's ESG scores with a reduction in its carbon footprint associated with thermal power plants, the company said.

## SDG 1 calls for ending poverty in all forms

- Jindal Steel & Power, under its corporate social responsibility, have made multidimensional efforts to reduce poverty by promoting income generation activities in the rural areas.
- JSPL Foundation facilitates inclusive economic growth by assisting small farmers and vulnerable communities to have sustainable earnings and improved quality of life.
- Promotion of community diary to generate additional income and formation and strengthening the farmers' groups for better access to finance information on backward and forward linkages are two major initiatives by the Foundation in this direction.
- The Foundation promotes LEISA (Low External Input on sustainable agriculture) practices by switching over from HEIIA (High External Input for Intensive Agriculture) in both Seasonal Agriculture and Cash crops including Horticulture and Tree based Agriculture.
- For the underprivileged and the vulnerable who are not in a position to take up income generation activities for physical/mental debilities, JSPL Foundation provides social security support.



**Poverty and hunger are closely related and the SDG-2 calls for zero hunger, food security and improved nutrition.**

- Under the project Sneh, JSPL Foundation provides nutrition support to underprivileged and vulnerable children and senior citizens in Odisha's Angul and Barbil and Chhattisgarh's Raigarh and Tamnar benefiting 1500 families, 5000 children and 300 senior citizens. This initiative has been very helpful in combating malnutrition and improving the educational performance of the children as well. During the COVID-19 pandemic the Company provided more than one million meals to the poor and vulnerable across India under its Mission Zero Hunger programme.
- In line with SDG-2, which calls for Good Health and Well-Being, the Foundation has taken up a number of initiatives to create and enhance health services and spread awareness about public health issues.
- Under the aegis of JSPL Foundation two multi-speciality Hospitals namely OP Jindal Hospital & Research Centre at Raigarh and Tamnar with 100 and 27 beds, respectively are operational providing state-of-art tertiary health care services. These two multi-speciality hospitals provide affordable health services to the community, besides free treatment for underprivileged sections of society.
- With an objective to make quality healthcare services accessible to rural communities, the Foundation has set up Telemedicine centres across the 7 locations in 3 Eastern States of India.

- Project Vatsalya, implemented by JSPL Foundation, has contributed to substantial improvement in maternal and child health in total 88 villages of Chhattisgarh, Jharkhand and Odisha.
- The Foundation's innovative programme Kishori Express has been addressing anaemia in adolescent girls and women in rural areas. A customised vehicle known as Kishori Express reaches out to villages and schools and conducts regular haemoglobin check-ups and community sensitisation to eliminate anaemia among girls. It also provides nutritional support as per requirement.
- As a part of its preventive healthcare programme, JSPL Foundation organised regular health camps and community sensitisation programmes in remote and tribal villages.
- In order to mitigate the social stigma and to identify and assist HIV positive members of the local community, JSPL Foundation often undertakes HIV screening and awareness camps.

## SDG-4 focuses on quality education

- JSPL Foundation has taken a series of initiatives to improve the quality of higher education, mass education, school education, skill education and special education for Persons with special needs.
- JSPL Foundation has supported the engagement of 178 community teachers in 113 vernacular schools across Odisha, Chhattisgarh and Jharkhand.
- O.P. Jindal Global (Institution of Eminence Deemed to Be University) founded by Jindal Steel & Power has been awarded the prestigious 'Institution of Eminence' status by the Government of India. Ranked among the top 800 universities in the world in the QS World University Rankings 2020, the University brings international learning experiences to the Indian higher education system and ranks as no 1 Private University in India .
- ASHA -The Hope Centres, are vocational and rehabilitation centres for children with special needs and seek to empower people with disabilities. The Centres located near JSP's operation in three states have provided support for cognitive, social and psychological development, opportunities for skill development, and special education to about 5000 specially abled children. In order to enable the meritorious needy and vulnerable students for higher education, JSPL Foundation has provided more than 10000 students across India.

## SGD-5 that calls for Gender Equality

- JSPL Foundation has been taking various initiatives for the socioeconomic empowerment of women.
- The Foundation's initiatives are focused on minimising the economic vulnerability of women in rural areas and augmenting their access to cash income on a sustainable basis.
- It supports the formation and capacity building of Women SHGs and facilitates backward and forward linkages for their income generation through training, seed money and marketing support.
- The Foundation has helped more than 12000 women SHG members to enhance their income.

## SDG-6 calls for Ensure availability and sustainable management of water and sanitation for all.

- JSPL Foundation is facilitating the community's access to clean and safe drinking water through the Installation of Water ATMs and overhead tanks, running Mobile Water Vans and installation of tube wells in villages.
- The Foundation has also set up two excess Iron Removal Plants to make potable water available for the rural community.
- Foundation's Drinking Water initiatives have benefitted more than 18 lakh people across three states.
- In line with the Government of India's Swachh Bharat Programme, the Foundation has also taken up multifaceted measures to make villages Open Defecation Free and improve sanitation.

- **For Affordable Clean Energy, as per SDG-8**

- JSPL Foundation promotes renewable energy by installing solar lights and solar operated pumps for irrigation.
- It also promotes smokeless cooking stoves as a part of its effort to provide clean and safe cooking fuels.

**Decent Work and Economic Growth is the 9th SDG**

- Jindal Steel & Power helps the community to have better economic opportunities by developing their skill in various areas.
- The Foundation has established OP Jindal Community Colleges at three locations and has skilled more than 100000 youths in various vocational trades.
- In order to refine the traditional skills, the Foundation supports the capacity building of traditional artisans and women, which has contributed in better earnings for them.
- In line with SDG 9, the Centre of Steel Technology and Product Development (CSTPD), established by Jindal Steel & Power at OP Jindal University is conducting research on reducing carbon footprint and thereby promoting green steel making.



## SDG-10 calls for reducing inequality

- JSPL Foundation makes various efforts to eliminate gender inequality by encouraging women's education, promoting women in sports like hockey and football, supporting women entrepreneurs for better income, strengthening and capital formation for Self Help Groups and regular gender sensitisation programmes in the rural and tribal areas.
- The Foundation has been actively working on not only the economic empowerment of the Women but also on their health front and in the facilitation of enhanced decision making power of the Women in families, Gramsabha and Panchayats.



## Jindal Steel & Power, as envisioned in SDG-11

- promotes building eco-friendly building technology for a sustainable future.
- It has developed its township with Schnell Home technology equipped with the building materials for reducing in-situ temperature and replacing wood and built its plants with zero outside discharge.
- The Company manages its waste in a responsible manner.

## SDG-12 calls for responsible consumption and production

- The Company focuses on reducing its energy and water consumption, recycling water and paper and reusing water paper and industrial slurry with no to plastic use.
- The JSPL Foundation in collaboration with NABARD has been implementing an Integrated Watershed Project over a catchment of 4000 acres in Angul district resulting in groundwater recharge across all slopes and controlling erosion of the topsoil and thereby doubling the farmers' income on a sustainable basis.

## SDG-13

- JSPL Foundation promotes community plantation in the peripheral villages across operational locations of JSP. More than one million saplings have been planted under this initiative. It has also set up 250 ponds, which act as carbon sinks. Jindal Steel & Power is the first Corporate in Odisha to implement watershed projects in partnership with NABARD.

## SGD-17

- In order to maximise the outcome of its social interventions, JSPL Foundation, as envisioned in SGD-17, operates in tandem with the Government and other development agencies to bring radical transformation in the lives of the communities and integrate them into the mainstream development process of the country.
- JSPL Foundation has been working with the local community consistently to build social capital by facilitating social investments in a participatory mode.
- In addition to the Government departments, the Foundation works with reputed organisations like NABARD, Sight Savers India, NACO, OSACS, Asia Heritage Foundation, Prayas, RAWA Academy and various other non-government organisations.

# Creative Segment:

## Future Job Roles:

- Nerve Center orchestrator
- Nerve Center data scientist
- Integrated master scheduler
- Team performance scientist
- Safety experience architect
- Intelligent asset care lead
- Specialist rock engineer
- Operations Super Team lead

# Nerve Center orchestrator

- ▣ Setting the vision and strategy for the Nerve center team with a focus on integrated, optimized digital operations and creating synergy between all operations, engineering processes and assets within the value chain.
- ▣ Through the holistic view and management of digitalized assets, operations and processes, will evaluate mine and plant performance. Their decisions will be augmented through AI & Analytics.
- ▣ Drive collaboration of cross-functional teams, enabling strong situational awareness and decision making based on knowledge, data and insights from relevant teams.

# Nerve Center data scientist

- ▣ Plays a hybrid role playing the critical link between digitilised operations, processes and assets.
- ▣ Generate, aggregate and prepare data as well as ensure data governance.
- ▣ Develop algorithms and data visualisations with built-in business logics and work flows to enable decision-making and exception-based monitoring.
- ▣ Receive requests and instructions from the Nerve Center Orchestrator regarding new analytics and data visualisations.
- ▣ Ensure integrity of data and algorithms through regular audits and apply ethical approaches when working with data.

THE END

THANK YOU