

West Bengal State Council of Technical &
Vocational Education and Skill
Development
(Technical Education Division)



Syllabus
of

Diploma in Mining Engineering [MIN]

Part-III (6th Semester)

2023

Semester VI

Sl. No	Category	Code No.	Course Title	Hours per week			Total contact hrs/ week	Credits	Marks
				L	T	P			
1.	Program core course	MINPC 601	Mine Legislation & General Safety	3	0	0	3	3	100
2.	Program core course	MINPC 602	Mine Machinery	3	0	0	3	3	100
3.	Program core course	MINPC 611	Mine Machinery Lab.	0	0	2	2	1	100
4.	Program elective course	MINPE 62*	Elective-IV	3	0	0	3	3	100
a.	ANY ONE COURSE HAS TO BE TAKEN FROM a & b	MINPE 621	Mine Hazards-II						
b.		MINPE 622	Mineral Economics						
5.	Humanities and Social Science course		Entrepreneurship and Start-ups ^	3	0	0	3	3	100
6.	Open elective course		Engineering Economics & Project Management ^	3	0	0	3	3	100
7.	Open elective course		Open Elective- II* (ANY ONE COURSE HAS TO BE TAKEN FROM THE LIST) ^	3	0	0	3	3	100
8.	Major Project	MINPR 651		0	0	4	4	2	100
9.	Seminar	MINSE 661		0	0	2	2	1	100
TOTAL							26	22	900

L- LECTURE, T- TUTORIAL, P- PRACTICAL/ LAB

^ - These courses are common for all disciplines.

***LIST OF OPEN ELECTIVE-II COURSES**

S No.	Code No.	Course Title	Hours per week			Credit
			L	T	P	
1.		Internet of Things	3	0	0	3
2.		Industrial Management	3	0	0	3
3.		Disaster Management	3	0	0	3
4.		Sustainable Development	3	0	0	3
5.		Industrial Safety	3	0	0	3
6.		Artificial Intelligence	3	0	0	3
7.		Renewable Energy	3	0	0	3
8.		Soft Computing Techniques	3	0	0	3
9.		Operations Research	3	0	0	3
10.		Electric Vehicle Technology	2	1	0	3

N.B: COURSE CURRICULUM OF OPEN ELECTIVE COURSES ARE SAME FOR ALL DIPLOMA PROGRAMS OF THE WEST BENGAL COUNCIL OF TECHNICAL & VOCATIONAL EDUCATION AND SKILL DEVELOPMENT. STUDENTS ARE ADVISED TO GET THE CURRICULUM FROM THE COUNCIL WEBSITE.

Course Code	:	MINPC 601
Course Title	:	Mine Legislation & General Safety
Number of Credits	:	3 (L : 3, T : 0, P : 0)
Prerequisites	:	Basic knowledge in Mining operations
Course Category	:	PC

TOPIC WISE DISTRIBUTION OF THE COURSE:

UNIT	TOPIC	LECTURE PERIODS	TUTORIAL PERIODS
I	CMR 2017 & MMR 1961: Provisions relating to Precautions against dangers from Fire, Dust, Gas and water	9	0
II	CMR 2017 & MMR 1961: Provisions relating to Ventilation, Provisions relating to Lighting and Safety lamps, Provisions relating to Explosives and Shotfiring.	9	0
III	Risk Management	9	0
IV	Mine Accidents	9	0
V	Miners' diseases	3	0
VI	Safety drives	6	0

Course Objectives:

Following are the objectives of this course:

- To learn about different statutory provisions regarding Fire, Dust, Gas and Water in mines.
- To learn about statutory provisions regarding Ventilation, Lighting, Safety lamps, Explosives and Shotfiring in mines.
- To have introductory concepts of risk management, hazard identification, risk assessment and control in mines.
- To learn about causes and preventive measures of accidents in mines.
- To know about Notified and other Miners' occupational diseases with symptoms and preventive measures to be taken for the same.
- To become familiar with different safety drives which are practised in mines.

Course Content:

Unit I : Coal Mines Regulation 2017, Metalliferous Mines Regulations 1961:

- Provisions relating to Precautions against dangers from Fire, Dust, Gas and water

Unit II : Coal Mines Regulation 2017, Metalliferous Mines Regulations 1961:

- Provisions relating to Ventilation,
- Provisions relating to Lighting and Safety lamps,
- Provisions relating to Explosives and Shotfiring.

Unit III: Risk Management

- Hazard identification - Formation of team - Tools of risk management (Documents for considerations) - Identification of hazards;
- Risk assessment- Process, risk score – scale for consequence, scale for exposure, scale for probability;
- Risk control; Auditing;
- Safety Management Plan (SMP): Elements of SMP

Unit IV: Mine Accidents

- Mine accidents- classifications, causes and preventions;
- Place of accident not to be disturbed, Emergency response and evacuation plan;
- Accident reports after investigation;
- Accident cost, frequency rate, severity rate;

Unit V: Miners' diseases

- Notified and other Miners' occupational diseases - their symptoms and preventions;

Unit VI: Safety drives

- Safety campaign, Internal Safety Organisation, safety audit;
- Safety committee, Composition and function of safety committee;
- Workers' participation in safety management, workmen's inspectors.

Suggested learning resources:

1. Coal Mines Regulations 2017
2. Metalliferous Mines Regulations 1961
3. DGMS Circulars and orders
4. Legislation in Indian Mines: A Critical Appraisal by S.D. Prasad and Rakesh
5. The Mines Rules, 1955
6. The Mines Act, 1952
7. A study of Mine Management, Legislation and General Safety by S. Ghatak
8. Mine Management, Legislation and General Safety by L.C. Kaku

Course outcomes:

After completing this course, student will able to –

- Apply the acquired knowledge to take precautionary measures against dangers from Fire, Dust, Gas and Water in mines.
- Apply the acquired knowledge to provide adequate ventilation in mines and carry out shotfiring operations in mines with safety.
- Take part in the processes of hazard identification with risk assessment and implementation of Safety Management Plan.
- Take necessary actions to prevent accidents in mines.
- Take necessary precautions against health hazards of miners.
- Be part of the different safety drives which are practised in mines.

Course Code	:	MINPC 602
Course Title	:	Mine Machinery
Number of Credits	:	3 (L : 3, T : 0, P : 0)
Prerequisites	:	Basic knowledge in Mathematics, Physics & Engineering Graphics
Course Category	:	PC

TOPIC WISE DISTRIBUTION OF THE COURSE:

UNIT	TOPIC	LECTURE PERIODS	TUTORIAL PERIODS
I	Winding System in Mine	12	0
II	Mine Transport System-Rope Haulage	9	0
III	Mine Transport System-Conveyors & Locomotives	9	0
IV	Wire Ropes and Rope Capel	6	0
V	Pit top & Pit Bottom Layout	6	0
VI	Electric Coal Drills & Jumbo Drills	3	0

Course Objectives:

Following are the objectives of this course:

- To have knowledge about different winding systems which are used in mines.
- To become familiar with different types of transport systems used in mines.
- To become familiar with the wire ropes used in mines.
- To understand different layouts at pit top & pit bottom for various winding systems.
- To understand the construction and operation of coal face drill and jumbo drill.

Course Content:

UNIT-I Winding System in Mine

- Purpose of Winding, Main equipment used for winding, Purpose of headgear, Height of headgear-factors for height, designing parameter; Headgear pulley, Constructional features of Headgear, Angle of fleet.
- **Cage** - Constructional Features, Cage Suspension Gear, Detaching Hook and its function, Safety Catches at Headgear, Keps, Guides used in mine shafts, Comparison between Rigid & Flexible Guide, Guide rope suspension & Tensioning arrangement, guide rope & winding rope changing.
- **Winding Drum**-Different profiles of winding drum- Their merits & demerits, attachment of winding rope to drum; Winding brakes - Mechanical-post and calliper brake, various safety devices on winding system including automatic contrivances for overwind; Over speed, slow banking etc.
- **Friction winding**- Principle, Ground mounted koepe and Tower mounted koepe- advantages and disadvantages of the system, Brief discussion on Multi-rope system of winding and its advantages; rope creep; Comparison between drum winding and koepe winding
- **Skip winding**- Advantages and disadvantages over cage winding, Method of automatically tipping skips in an incline shaft.

UNIT-II Mine Transport System- Rope Haulage

- Different types of Rope Haulage – Description with simple sketches, Applicability, Advantages and Disadvantages.
- Different safety devices incorporated on rope haulages including Jazz rail, Back catch, Spring catch, Drop warwick, Inter-coupled stop block & Runway switch, Drags etc.
- Different types of rope clips, tub couplings.
- Size of rail sleepers & rail fastening arrangements, Fish plates, Ballast, Jim crow, Super elevation, Transition curve, Reverse curve, Goose neck curve, Diamond crossing etc.

UNIT-III Mine Transport System-Conveyors & Locomotives

- Different types of conveyors- Shakers Conveyor, Belt Conveyor, Scraper Chain Conveyor, & Armoured Flexible Conveyor ; Their principles of operation, Application, Merits and Demerits. Drive of Belt conveyor, loop take-up arrangement, troughed belt, and carrying capacity of belt conveyor, Average Loading Factor; Tensioning Arrangement.
- Different types of locomotive haulage systems: Brief on Diesel Locomotive, Electric Locomotive, Battery Locomotive and Compressed Air Locomotive; their applications merits and demerits; Safety devices of Diesel locomotives including flame trap and exhaust conditioner box.

UNIT-IV Wire Ropes and Rope Capel

- Wire- Testing of wires of rope, Contraction of various types of rope used in mining; Factor of Safety (F.O.S) of rope; Nominal and actual F.O.S. and Factors influencing the F.O.S., Space Factor, Bending Factor etc.; Laying of rope, Deterioration of rope, Care and maintenance of rope in use and also in storage; Splicing of haulage rope; Calculation of size of winding rope; Examination of rope; Life of rope and norms for discarding of a rope; Length of rope.
- Rope capel for haulage, winding and recapping.

UNIT-V Pit top & Pit Bottom Layout

- Factors affecting the pit top and pit bottom layout, Objectives of pit top and pit bottom layout.
- Pit top & Pit Bottom Layout for cage winding - Essential features of the layout, Brief discussion on different types of layouts.
- Brief discussion on Pit top & Pit Bottom Layout with skip winding.

UNIT-VI Electric Coal Drills & Jumbo Drills

- Electric coal drill- constructional features, specifications, operation & uses.
- Jumbo drills- constructional features, specifications, operation & uses.

Suggested learning resources:

1. Elements of Mining Technology , Vol-3 by D.J Deshmukh
2. Mine Transport by Kerlin
3. Introduction to Mining, G.K.Pradhan, Mintech Publications, Bhubaneswar
4. Mine Machinery by Arvind & Anand.
5. Mining Machinery-I by M. Kumaraswamy.
6. Mining Machinery-II by M. Kumaraswamy.

Course outcomes:

After completing this course, student will able to –

- Explain the design of the headgear and different safety fittings of winding arrangements in belowground mines.
- Supervise various systems of transportation of men, machines & mineral/coal in underground mines.
- Understand the uses of wire ropes and take safety precautions of its uses in mines.
- Explain pit-top & pit-bottom layouts efficiently.
- Apply the acquired knowledge to supervise drilling operations in mines.

Course Code	:	MINPC 611
Course Title	:	Mine Machinery Lab.
Number of Credits	:	1 (L : 0, T : 0, P : 2)
Prerequisites	:	Basic knowledge in Mathematics, Physics & Engineering Graphics
Course Category	:	PC

Course Objectives:

Following are the objectives of this course:

- To know about different winding drum profiles used in mines.
- To inculcate knowledge about cage & shaft fittings used in mines.
- To understand the haulage transport systems used in mines including their safety features.
- To become familiar with different types of wire ropes used in mines.
- To understand the construction and operation of coal face drill used in mines.

List of practicals to be performed:

1	Study & sketch of different profiles of winding drum.
2	Study & sketch of headgear.
3	Study & sketch of safety detaching hook.
4	Study & sketch of different types of safety devices used in rope haulage systems in mines
5	Study & sketch of coal tubs, tub-couplings, haulage clips etc.
6	Study & sketch of different types of wire ropes used for mining purposes.
7	Study & sketch of different types of rope capels.
8	Study & sketch of Coal Face Drill.

Suggested learning resources:

1. Elements of Mining Technology , Vol-3 by D.J Deshmukh
2. Mine Transport by Kerlin
3. Introduction to Mining, G.K.Pradhan, Mintech Publications, Bhubaneswar
4. Mine Machinery by Arvind & Anand.
5. Mining Machinery –by M. Kumaraswamy.
6. Mining Machinery-II by M. Kumaraswamy.
7. Principle & Practices of Coal Mining, R.D. Singh

Course outcomes:

After completing this course, student will be able to-

- Understand the uses of different types of winding drums used in mines.
- Supervise the cage & shaft fittings of a belowground mine.
- Supervise the underground haulage system of a mine.
- Understand the applications of wire ropes used in mines.
- Apply the acquired knowledge to supervise drilling operations in mines.

Course Code	:	MINPE 621
Course Title	:	Mine Hazards- II
Number of Credits	:	3 (L: 3, T: 0, P: 0)
Prerequisites	:	Basic knowledge in Mathematics, Physics, Chemistry & Engineering Graphics
Course Category	:	PE

TOPIC WISE DISTRIBUTION OF THE COURSE:

UNIT	TOPIC	LECTURE PERIODS	TUTORIAL PERIODS
I	The Mines Rescue Rules, 1985	9	0
II	Rescue apparatus	9	0
III	Mine Lighting	9	0
IV	Pollution due to Mining operations	6	0
V	Additional Environmental impact due to mining operations	6	0
VI	Safety aspects in opencast mining	6	0

Course Objectives:

Following are the objectives of this course:

- To learn about different statutory provisions of ‘The Mines Rescue Rules,1985’.
- To learn about different rescue apparatus used in rescue operations in mines.
- To be aware of the problem of lighting in mines and the standards of illumination to be maintained in mines.
- To know about different contributing factors of environmental pollution in mining operations along with control measures to be taken.
- To know about the impact on the environment by mining activities.
- To be familiar with different hazards in opencast mines and controlling measures for the same.

Unit I: The Mines Rescue Rules, 1985:

- Rescue Stations and functions of Rescue Stations
- Rescue Rooms and functions of Rescue Rooms
- Organisations and equipment in mines: Telephone communication, Rescue Tracings, Appointment of Rescue Trained Persons in mines, selection of persons for training in rescue work;
- Entry into below ground mines for rescue or recovery work
- Fresh air bases
- Rescue team

Unit II: Rescue apparatus

- Self contained breathing apparatus;
- Gas mask;
- Smoke helmets;
- Self rescuer;
- Reviving apparatus;

Unit III: Mine Lighting

- Problems of lighting in mines;
- Standard of illumination in underground coal and metalliferous mines;
- Standard of illumination in opencast coal and metalliferous mines;
- Construction and working principles of cap lamps; topping up operation and charging of cap lamp;
- Lamp room layout and organisation;
- LED cap lamp: Important features, advantages;

Unit IV: Pollution due to Mining operations

- Air pollution due to dust- smoke -fumes- gases, control measures;
- Water pollution due to mining, control measures;
- Noise pollution, control measures;
- Heat addition, control measures.

Unit V : Additional Environmental impact due to mining operations

- Land damage and land degradation;
- Damages on forest – effects on flora and fauna;
- Global warming and greenhouse effect;
- Radioactive emission;
- Cultural degradation;
- Damage to local inhabitants.

Unit VI: Safety aspects in opencast mining

- Vibration - its effects, precautionary measures to control ground vibration due to blasting in Opencast mines;
- Problems of fly rock – causes of fly rock – control of fly rock.
- Accidents in Opencast mines - cause wise and place wise (elementary ideas only) , preventive measures (elementary ideas only).

Suggested learning resources:

1. The Mines Rescue Rules, 1985
2. DGMS Circulars and orders
3. Legislation in Indian Mines: A Critical Appraisal by S.D. Prasad and Rakesh
4. Environmental effects of mining - wikipedia
5. Elements of mining technology Vol. 2. By D.J. Deshmukh

Course outcomes:

After completing this course, student will able to –

- understand different statutory provisions of ‘The Mines Rescue Rules,1985’.
- use his acquired knowledge in selection and use of some rescue apparatus in need.
- take necessary steps in maintenance of illumination standards as per DGMS guidelines.
- understand the adverse impacts of mining operations on the environment and know the controlling measures.
- identify the hazards associated with some mining operations in opencast mines with controlling measures for the same.

Course Code	:	MINPE 622
Course Title	:	Mineral Economics
Number of Credits	:	3 (L: 3, T: 0, P: 0)
Prerequisites	:	Basic knowledge in Mathematics, Physics, Chemistry & Engineering Graphics
Course Category	:	PE

TOPIC WISE DISTRIBUTION OF THE COURSE:

UNIT	TOPIC	LECTURE PERIODS	TUTORIAL PERIODS
I	Mineral Economics- Introduction	6	0
II	Mine Sampling	6	0
III	Resource-Reserve Dynamics	9	0
IV	Mine Investment Analysis	9	0
V	Mine Finance and Accounting	6	0
VI	Mineral Taxation and Pricing	3	0
VII	National Mineral Policy	6	0

Course Objectives:

Following are the objectives of this course:

- To have a basic concept of economics of depleting resources.
- To choose a proper method of sampling for different ore bodies and mineral heaps.
- To estimate grade and reserves.
- To choose a proper method for valuation of any mine and also be able to determine the NPV of any mine.
- To perform various financial management aspects related to the mine.
- To have an elementary idea on National Mineral Policy.

Course Content:

Unit-I Mineral Economics- Introduction

- Mine and Mineral Economics- scope and definitions;
- Economics of Depleting Resources;
- Major Issues- availability, secondary supply and conservation.

UNIT-II Mine Sampling

- Theory of Sampling; Common Methods; Size and Spacing;
- Sample Preparation; Errors in Sampling; Interpretation of Sampling Results

Unit-III Resource-Reserve Dynamics

- Mineral Resource Classification- JORC system, UNFC;
- Methods of calculation of reserves-
 - Contour lines method
 - Mean arithmetic method
 - Polygon method
 - Section method
- Problems on calculation of average width and grade of an ore body.

Unit-IV Mine Investment Analysis

- Time Value of Money- present and future values, Basic ideas of Net Present Value (NPV) and Internal Rate of Return (IRR) with simple calculations only;
- Cash Flow and Discounted Cash Flow Analysis- discount factors, risk and uncertainty, inflation adjustments, Feasibility Analysis
- Mine Project financing, its risks and constraints
- Impact of depreciation, depletion, type of funding, reserves, life etc. on mine profitability

Unit-V Mine Finance and Accounting

- Cost of Capital; Sources of Finance- shares, debentures, fixed deposit, sinking fund, capital gearing;
- Cost Accounting; Cost-Volume-Profit Analysis, Break-even analysis;
- Depreciation and Amortisation;
- Cost control measures

UNIT-VI Mineral Taxation and Pricing

- Objectives and Principles of Mineral Taxation;
- Mineral Taxation in India;
- Mineral Pricing in brief

UNIT-VII National Mineral Policy

- Objectives and Elements;
- National Mineral Policy of India;
- Implementation Strategies in brief

Suggested learning resources:

1. Deshmukh, R. T., Mineral and Mine Economics, Mira Publication., Nagpur, 1986
2. Sinha R. K. and Sharma, N. L., Mineral Economics, Oxford & IBH Pub., 3rd ed, 1970
3. Ray S. C. and Sinha, I. N., Mine and Mineral Economics, PHI Learning, 2016
4. Arogyaswamy, R. N. P., Courses in Mining Geology, Oxford and IBH Pub., 2nd ed, 1973
5. Chatterjee K. K. 1993. An Introduction to Mineral Economics. Wiley Eastern Limited. New Delhi. 353 pages
6. Khanna, O. P., Industrial Engineering and Management, Dhanpat Rai Delhi, 1993
7. Krishnaswamy, S., India’s Mineral Resources, Oxford & IBH pub., 2nd ed, 1972
8. Jain, P. K., Financial Management, Tata McGraw Hill, 1981

Course outcomes:

After completing this course, student will able to –

- understand the basic concept of economics of depleting resources.
- choose a proper method of sampling for different ore bodies and mineral heaps.
- estimate grade and reserves.
- build fundamental concepts of rate of return on mine investment which will help them to take crucial financial decisions in their future position as manager.
- perform various financial management aspects related to the mine in their future position as manager.
- identify and implement the various aspects of National Mineral Policy.

Course Title	Entrepreneurship and Start-ups
Course Code	HS 302
Number of Credits	3
Pre Requisites	None
Total Contact Hours	3 (L: 2; T: 1) /week = 45 hrs
Course Category	HS

Course Learning Objectives

1. To raise awareness, knowledge and understanding of enterprise/ entrepreneurship.
2. To motivate and inspire students toward an entrepreneurial career.
3. To understand the venture creation process and to develop generic entrepreneurial competences.
4. To introduce students to the basic steps required for planning, starting and running a business.
5. To familiarise students with the different exit strategies available to entrepreneurs.

Course Outcomes:

After completing the course students will able to:

CO 1	Identify qualities of entrepreneurs, develop awareness about entrepreneurial skill and mindset and express knowledge about the suitable forms of ownership for small business
CO 2	Comprehend the basics of Business idea, Business plan, Feasibility Study report, Project Report and Project Proposal
CO 3	Understand the concept of start-up business and recognise its challenges within legal framework and compliance issues related to business.
CO 4	Make a Growth Plan and pitch it to all stakeholders and compare the various sources of funds available for start-up businesses

Detailed Course Content

Unit	Name of the Topic	Hours
1.	<p>ENTREPRENEURSHIP – INTRODUCTION AND PROCESS</p> <ul style="list-style-type: none">● Concept, Competencies, Functions and Risks of entrepreneurship● Entrepreneurial Values & Attitudes and Skills● Mindset of an employee/manager and an entrepreneur● Types of Ownership for Small Businesses● Sole proprietorship● Partnerships● Joint Stock company- public limited and private limited companies● Difference between entrepreneur and Intrapreneur	10

2.	<p>PREPARATION FOR ENTREPRENEURIAL VENTURES</p> <ul style="list-style-type: none"> ● Business Idea- Concept, Characteristics of a Promising Business Idea, Uniqueness of the product or service and its competitive advantage over peers. ● Feasibility Study – Concept – Locational, Economic, Technical and Environmental Feasibility. Structure and Contents of a standard Feasibility Study Report ● Business Plan – Concept, rationale for developing a Business Plan, Structure and Contents of a typical Business Plan ● Project Report- Concept, its features and components ● Basic components of Financial Statements- Revenue, Expenses (Revenue & capital exp), Gross Profit, Net Profit, Asset, Liability, Cash Flow, working capital, Inventory. Funding Methods-Equity or Debt. <p>Students are just expected to know about the features and key inclusions under, Business Plan and Project Report. They may not be asked to prepare a Business Plan/ Project Report/ Project Feasibility Report at the End of Semester Examination.</p>	20
3.	<p>ESTABLISHING SMALL ENTERPRISES</p> <ul style="list-style-type: none"> ● Legal Requirements and Compliances needed for establishing a New Unit- ● NOC from Local body ● Registration of business in DIC ● Statutory licence or clearance ● Tax compliances 	03
4.	<p>START-UP VENTURES</p> <ul style="list-style-type: none"> ● Concept & Features ● Mobilisation of resources by start-ups: Financial, Human, Intellectual and Physical ● Problems and challenges faced by start-ups. ● Start-up Ventures in India – Contemporary Success Stories and Case Studies to be discussed in the class. <p>Case studies have been included in the syllabus to motivate and inspire students toward an entrepreneurial career from the success stories. No questions are to be set from the case studies.</p>	04

5.	FINANCING START-UP VENTURES IN INDIA <ul style="list-style-type: none"> • Communication of Ideas to potential investors – Investor Pitch • Equity Funding, Debt funding – by Angel Investors, Venture Capital Funds, Bank loans to start-ups • Govt Initiatives including incubation centre to boost start-up ventures • MSME Registration for Start-ups –its benefits 	06
6.	EXIT STRATEGIES FOR ENTREPRENEURS <ul style="list-style-type: none"> • Merger and acquisition exit, Initial Public Offering (IPO), Liquidation, Bankruptcy – Basic Concept only 	02

Examination Scheme

- End Semester Examination: 60 marks

Suggested Question Paper Scheme for End Semester Examination

Group A: 20 marks

Question Type	Number of questions to be set	Number of questions to be answered
MCQ, Fill in the blanks, True or False (Carrying 1 mark each)	25	20

Group B: 40 marks

Question Type	Number of questions to be set	Number of questions to be answered
Subjective Type questions (Carrying 8 marks each)	10	5

- Internal Assessment: 40 marks
- Class test : 20 marks
- Assignment: 10 marks
- Class attendance: 10 marks

Suggested Learning Resources

Sl. No.	Title of Book	Author	Publication
1.	Entrepreneurship Development	Sangeeta Sharma	Prentice Hall of India Learning Private Ltd

2.	Entrepreneurship Development	S. Anil Kumar	New Age International
3.	Fundamentals of Entrepreneurship	<u>Sangram Keshari Mohanty</u>	Prentice Hall of India Learning Private Ltd
4.	Fundamentals of Entrepreneurship	<u>Dr. G.K. Varshney</u>	Sahitya Bhawan Publication
5.	Managing New Ventures: Concepts and Cases On Entrepreneurship	Anjan Raichaudhuri	Prentice Hall of India Learning Private Ltd
6.	How to Start a Business in India	Simon Daniel	Buuks, Chennai
7.	Entrepreneurship and Small Business Management	S.S. Khanka	S. Chand & Sons, New Delhi
8.	Entrepreneurship Development and Business Ethics	Abhik Kumar Mukherjee & Shaunak Roy	Oxford University Press
9.	Entrepreneurship Development and Business Ethics	Dr B Chandra & Dr B Biswas	Tee Dee Publications
10.	Entrepreneurship Development Small Business Entrepreneurship	Poornima Charantimath	Pearson Education India

Course Code	:	MINPR 651
Course Title	:	Major Project
Number of Credits	:	2 (L : 0, T : 0, P : 4)
Prerequisites	:	Knowledge of all courses of Mining Engineering
Course Category	:	PR

Course Objectives:

Following are the objectives of this course:

- To understand the inter- relationship among different courses learnt in the Diploma Program.
- To work in a team by preparing a model/ preparing a research work and making a presentation/ facing viva-voce.
- To get a platform to learn the basic idea of paper writing.

Procedures to be observed:

Students will carry out their Project Work in group or individually under the supervision of a Faculty of their department who will work as a Project Guide. Number of students per group may vary with the strength of the students and the topics provided.

The Major Project shall include preparation of a Project Report which, among other things, consists of technical description of the project. The Report should be submitted in two copies, one to be retained in the library of the institute. The students shall prepare a presentation on the project topic and deliver it and/or face viva-voce.

This project work may be the continuation of the Project Work of the previous semester.

The Major Project work will be based mainly on the topic of Mining Engineering courses.

Course outcomes:

After completing this course, student will be able to:

- To work as a team member.
- Interrelate different aspects of engineering and/ or present in a model.
- Write and present a technical research paper.

Course Code	:	MINSE 661
Course Title	:	Seminar
Number of Credits	:	1 (L : 0, T : 0, P : 2)
Prerequisites	:	Communication skills with knowledge in all courses of Mining Engineering and allied courses
Course Category	:	SE

Course Objectives:

Following are the objectives of this course:

- To enable students to prepare and present the project/ research work by making a presentation, preferably a powerpoint presentation.
- To prepare the students for Group Discussion.

Course Content:

- Preparation of presentation, preferably power-point presentation of the projects (major/ minor) undertaken and delivering it.
- Group Discussion on several topics related to the industry/ education.

Course outcomes:

After completing this course, student will be able to:

- Present a technical project/ research paper.
- Participate in a Group Discussion (GD) in proper manner.

