



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Diploma Engineering

Level: Diploma

Branch: Mining Engineering

Subject Code: DI04022041

Subject Name: Mine Management, Safety and Legislation

w. e. f. Academic Year:	2024-25
Semester:	4 th
Category of the Course:	PCC

Prerequisite:	<p>To study the Mine Management, Safety, and Legislation, students should be well-versed in basic mining engineering concepts. They must understand how different mining methods and equipment operate in real-world conditions. Familiarity with common risks in mining and standard safety procedures is crucial. A background in mining-related environmental concerns and regulations is also helpful. Knowledge of legal frameworks and basic organizational management in mining is required for this subject.</p>
Rationale:	<p>The course is designed to help the student in understanding the different statutory provisions of mines acts, rules and regulations essential for mining industries for maintaining law and order as well as safe working conditions in mining areas.</p> <p>Diploma holders are supposed to work as supervisors in mines, where they have to manage the resources of the organization for safe, efficient and effective utilization of equipment, manpower, and time. Hence they should be aware of general management concepts, government laws, regulations, safety laws, etc.</p> <p>This course aims to develop such knowledge which is required for effective and efficient management of mines as well as to equip future diploma mining engineers with the knowledge and skills to implement various necessary conditions as per legal frameworks, prioritize safety, uphold ethical standards, and contribute to sustainable mining practices throughout their careers.</p>

Course Outcome:

After Completion of the Course, Student will able to:

No.	Course Outcomes	RBT Level
01	Recognize the fundamental of mine management principles, concepts and their application in the field of mining.	R, U, A
02	Implement general provisions of mines act 1952 and mines rules 1955 in mines.	R, U
03	Encourage the implementation of all provisions of Coal Mine Regulation 2017 in mines.	R, U, A



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04	Encourage the implementation of all provisions of Metalliferous Mine Regulation 1961 in mines.	R, U, A
05	Adopt healthier and safety practices in the mining area.	R, U

*Revised Bloom's Taxonomy (RBT)

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR		C	Theory		Tutorial / Practical	
			ESE (E)		PA (M)	PA (I)	ESE (V)	
3	0	0	3	70	30	0	0	100

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	General Principles Of Management	10	24
	1.1 Definition of Mine management.		
	1.2 Principles of scientific management.		
	1.3 Role of mining Industry in country's economic development.		
	1.4 DGMS.		
	1.4.1 Introduction of DGMS.		
	1.4.2 Role & Function of DGMS.		
	1.4.3 Examinations Conducted by DGMS.		
	1.5 Mining company organizational structures.		
	1.6 Qualities of good supervisor.		
	1.7 Work study:		
	1.7.1 Principles and advantages of time study.		
	1.7.2 Principles and advantages of method study.		
1.8 Functions of trade unions.			
1.9 Strikes and lockouts as per Industrial Dispute Acts.			
1.10 Corporate Social Responsibility (CSR).			
1.10.1 Objectives of CSR.			
1.10.2 Advantages of CSR activities.			



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	1.10.3 Various ways of implementing CSR activities in mining areas.		
2.	Mine Legislation (Part-I): Mine Act 1952 & Mines Rules 1955 2.1 Mine Act 1952. 2.1.1 Provisions related to committee constructed under section 12. 2.1.2 Provisions related to the drinking water. 2.1.3 Provisions related to employment of a persons below 18 years of age. 2.1.4 Provisions of Act in respect of notice to be given about accidents. 2.1.5 Provisions related to hours of work below ground and above ground. 2.1.6 Provisions of limitations of daily hours of work including overtime. 2.1.7 Provisions of act related to leave wages. 2.2 Mines Rues 1955. 2.2.1 Important definitions. 2.2.2 Provisions related to lavatories, urinals on surface and underground. 2.2.3 Rules related to First Aid. 2.2.4 Provisions related to Pit safety committee. 2.2.5 Rules related to qualification, appointment and duties of welfare officer. 2.2.6 Rules related to qualification, appointment and duties of workmen inspector. 2.2.7 Provisions related to welfare amenities.	08	16
3.	Mine Legislation (Part-II): Coal Mine Regulation 2017. 3.1 Important definitions. 3.2 The other terms limited to CMR only - Define the terms Shot firer, Overman, Assistant or Under manager, on setter, Fiery seam, Gassy seam of first, Second and third degree, General body of air. 3.3 Duties and responsibilities of Overman, Sirdar, Manager, Safety Officer, and Ventilation Officer. 3.4 General requirements about mine Plans & types of mine plan. 3.5 Provisions related to open cast working. 3.6 Provisions related to setting of supports. 3.7 Provisions related to development & depillaring operation. 3.8 Provisions related to precaution against dust. 3.9 Provisions related to precaution against eruption of gas.	10	24



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	<p>3.10 Provisions related to dangers from underground inundation. 3.11 Provisions related to precautions after a fire has broken out. 3.12 Provisions related to standards of ventilation. 3.13 Precautions against fire in the ventilation appliances. 3.14 Precautions against inflammable gases and noxious gases. 3.15 Provisions related maintenance, examination and use of safety lamp.</p>		
4.	<p>Mine Legislation (Part-III): Metalliferous Mine Regulation 1961</p> <p>4.1 Important definitions. 4.2 Duties & responsibilities of Workmen, Assistant manager/ Underground manager, Mining mate, Blasters, Winding enginemen, Haulage enginemen, Magazine in-charge. 4.3 Provisions related to ladders and ladderways. 4.4 Provisions related to man winding, winding in sinking shaft, examination of winding equipment. 4.5 Provisions related to haulage roadways, travelling roadways, examination of haulage engines and track. 4.6 Provisions related to danger from Surface water, underground inundation. 4.7 Provisions related to bractices, doors, stopping, air crossing & auxiliary fan. 4.8 Provisions related to general lighting and standards of lighting in mines. 4.9 Provisions related drilling charging stemming and firing of short holes, inspection after short firing. 4.10 Provisions related to storage of explosives, magazines, cartige transport of explosives. 4.11 Provisions related to misfire & general precautions regarding explosive.</p>	10	24
5.	<p>Accident, Health And Safety</p> <p>5.1 Introduction of mine safety. 5.2 Definitions of accident: Fatal, Serious bodily injury, reportable injury, Minor injury, Disaster and Major accident. 5.2.1 Unsafe acts of persons. 5.2.2 Unsafe conditions. 5.2.3 Accident Investigation Procedure. 5.3.4 Structure of the accident report.</p>	07	12



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5.4	Various safety propaganda techniques. [Safety Banners, Safety Week, National Safety Awards (Mines), Importance of safety conferences, Safety Policy]		
5.5	Cost of accidents.		
5.5.1	Direct and Indirect cost of accidents.		
5.5.2	Zero accident potential (ZAP) working.		
5.5.3	Minimum accident potential (MAP) working.		
5.6	Occupational diseases in mining, their causes and preventive measures.		
Total		45	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	U Level	A Level	N Level	E Level	C Level
50	30	20	0	0	0

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

Sr. No.	Title of Book	Author	Publication with place, year and ISBN
1	Mine Management (Latest Edition)	V.N.Singh	Lovely Prakashan, Dhanbad ISBN-13: 978-8179561591
2	Safety In Mines (Latest Edition)	Kejariwal B.K.	Lovely Prakashan, Dhanbad
3	Mine Management Legislation & General Safety	H.N.Karmakar & R.RAMAN	Published by : H.N.Karmakar
4	A Study Of Mine Management, Legislation And General Safety (Latest Edition)	L.C.Kaku	Lovely Prakashan, Dhanbad ISBN-13: 978-8179561591
5	Mine's management legislation and General Safety (Mine Capsule)	Ranjan Kumar	Lovely Prakashan, Dhanbad



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Sr. No.	Title of Book	Author	Publication with place, year and ISBN
6	Mine Management Legislation & General Safety (Latest Edition)	Dr. N.C.Dey	Lovely Prakashan, Dhanbad ISBN-13: 978-8179561324

(b) Open-source software and website:

Unit 1 : General Principles of Management

- [https://nscpolteksby.ac.id/ebook/files/Ebook/Hospitality/Production%20and%20Operations%20Management%20\(2008\)/8.%20Chapter%207%20%20WORK%20STUDY%20%28TIME%20AND%20MOTION%20STUDY%29.pdf](https://nscpolteksby.ac.id/ebook/files/Ebook/Hospitality/Production%20and%20Operations%20Management%20(2008)/8.%20Chapter%207%20%20WORK%20STUDY%20%28TIME%20AND%20MOTION%20STUDY%29.pdf)
- Examination (dgms.gov.in)
- ORGANISATIONALSTRUCTURE.pdf (dgms.gov.in)About DGMS
- https://www.youtube.com/watch?v=vNO_AR_-F54
- https://www.youtube.com/watch?v=kFWrFTb5pc4&list=PLgk8purBMo_vZjJdq_Pn101t6k93TjVp&index=4
- https://www.youtube.com/watch?v=ktNfLC66wm4&list=PLgk8purBMo_vZjJdq_Pn101t6k93TjVp&index=5
- Trade Union Act 1926-
https://www.indiacode.nic.in/bitstream/123456789/13322/1/trade_unions_act_1926
- The Industrial Dispute Act 1947 –
https://www.indiacode.nic.in/bitstream/123456789/17112/1/the_industrial_disputes_act.pdf

Unit 2 : Mine Legislation (Part - I) - Mines Act 1952 & Mines Rules 1955

Mine Act 1952 - <https://labour.gov.in/sites/default/files/theminesact1952.pdf>

- <https://www.youtube.com/watch?v=rLUAHVpLVU8&t=668s>
- <https://www.youtube.com/watch?v=RvzqQYWLGRi>

Mine Rules 1955 -

https://www.dgms.gov.in/writereaddata/UploadFile/Mines_Rules_1955.pdf

- <https://www.youtube.com/watch?v=1EUBQ8JqcXE&pp=ygUbbWluZXMgcgnVsZXMgMTk1NSBkZWZpbmF0aW9u>



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2. <https://www.youtube.com/watch?v=mobw1Jb03Ns>
3. <https://www.youtube.com/watch?v=xgZZVXaA0Dw>
4. <https://www.youtube.com/watch?v=oDkNful6zSc&t=12s>
5. https://www.youtube.com/watch?v=Y8bZGRSY_rk
6. <https://www.youtube.com/watch?v=FCNSNz4dsjs>
7. <https://www.youtube.com/watch?v=tr4K2vOY8c4>

Unit 3 :Mine Legislation (Part – II) CMR 2017

CMR 2017 - <https://www.dgms.net/Coal%20Mines%20Regulation%202017.pdf>

1. https://www.youtube.com/watch?v=jujzSS_AL-Q&list=PLG--VdFWYp2nton--xg821FTENZI3amKA&index=1&pp=iAQB
2. <https://www.youtube.com/watch?v=fVJjAaokXWk&list=PLG--VdFWYp2nton--xg821FTENZI3amKA&index=4&pp=iAQB>
3. <https://www.youtube.com/watch?v=olnrgd4iMQY&list=PLG--VdFWYp2nton--xg821FTENZI3amKA&index=5&pp=iAQB>
4. <https://www.youtube.com/watch?v=iireHH2YhI4&list=PLG--VdFWYp2nton--xg821FTENZI3amKA&index=12&pp=iAQB>
5. <https://www.youtube.com/watch?v=FgTUIxEC0iw&list=PLG--VdFWYp2nton--xg821FTENZI3amKA&index=13&pp=iAQB>
6. <https://www.youtube.com/watch?v=ju1hhGLje3g&list=PLG--VdFWYp2nton--xg821FTENZI3amKA&index=14&pp=iAQB>
7. <https://www.youtube.com/watch?v=gYWKObktQLc&list=PLG--VdFWYp2nton--xg821FTENZI3amKA&index=15&pp=iAQB>
8. <https://www.youtube.com/watch?v=ihyfZcWHWjI&list=PLG--VdFWYp2nton--xg821FTENZI3amKA&index=17&pp=iAQB>
9. <https://www.youtube.com/watch?v=0RVJG8jahE0&list=PLG--VdFWYp2nton--xg821FTENZI3amKA&index=18&pp=iAQB>
10. <https://www.youtube.com/watch?v=E2n0pYDjjOg&list=PLG--VdFWYp2nton--xg821FTENZI3amKA&index=20&pp=iAQB>
11. https://www.youtube.com/watch?v=ObV-lcbWs_M&list=PLG--VdFWYp2nton--xg821FTENZI3amKA&index=21&pp=iAQB
12. https://www.youtube.com/watch?v=kGjC946_vXo&list=PLG--VdFWYp2nton--xg821FTENZI3amKA&index=23&pp=iAQB
13. <https://www.youtube.com/watch?v=k53xCETpmhY&list=PLG--VdFWYp2nton--xg821FTENZI3amKA&index=25&pp=iAQB>
14. <https://www.youtube.com/watch?v=mMK8qG4Jb9o&list=PLG--VdFWYp2nton--xg821FTENZI3amKA&index=19&pp=iAQB>



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Unit 4: Mine Legislation (Part – III) MMR 1961

MMR 1961 - <https://www.dgms.gov.in/writereaddata/UploadFile/Metalliferous1961.pdf>

1. <https://www.youtube.com/watch?v=ApfbmuSJeU8>
2. <https://www.youtube.com/watch?v=p-xh5i11YJA>
3. <https://www.youtube.com/watch?v=ESjWduNp9Gc>
4. <https://www.youtube.com/watch?v=-3gRQJceufw>
5. <https://www.youtube.com/watch?v=6uT6i1enmDk>
6. <https://www.youtube.com/watch?v=60yeRai9eEc>
7. https://www.youtube.com/watch?v=1Vg4_gdFKXo
8. https://www.youtube.com/watch?v=nkgsuDc_EpY
9. <https://www.youtube.com/watch?v=ufoYAXX5Kck>
10. <https://www.youtube.com/watch?v=UcyPmUYT-gE>
11. https://www.youtube.com/watch?v=JU4NSX_X7KY
12. <https://www.youtube.com/watch?v=s4B44bIaB8k>
13. <https://www.youtube.com/watch?v=O5wV5GCgFWg>
14. <https://www.youtube.com/watch?v=mHyYV0XJNMQ>

Unit 5: Accident, Health And Safety

1. <https://www.youtube.com/watch?v=PQL70zNbnzw&pp=ygUfYWNjaWRlbnQgaGVhbHRoICYgc2FmZXR5IG1pbmluZw%3D%3D>

Suggested Project List:

1. Power point presentation on latest circulars published by DGMS.
2. Enlist various CSR activities by a nearby Mining company in brief and prepare report on it.
3. Enlist various mining trade unions, their recent activities and prepare a report on it.
4. Prepare report of any near by mines regarding their organizational chart and functioning of pit safety committee.
5. Power point presentation on duties and responsibilities of Mine Manager, Safety Officer, Ventilation Officer and other mining officials as per CMR 2017 & MMR 1961.
6. Make SOP related poster on precautions against dust & eruption of gases in surface as well as underground gassy mines as per CMR 2017.
7. Make SOP related poster on examination & uses of safety lamp carried out in underground gassy mines as per MMR 1961.
8. Prepare a poster showing all CONVENTIONS FOR PREPARING PLANS AND SECTIONS as



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per CMR 2017

9. Prepare a notice of diseases encountered by a miner as per form-V of MMR 1961.
10. Prepare a banner related occupational diseases with precautionary measures.
11. Present case study of a mines accident inquiry report.

Suggested Activities for Students:

1. Field visit to explain mine organizational set up and identify responsibilities and powers of different job positions.
2. Field visit to mine for study safety features being used by the organization.
3. Use case study method to explain management and safety related problems related to mining industries.
4. Attend the expert lecture on following topics of mine legislation: Mines Act 1952, Mines Rules 1955, CMR 2017 & MMR 1961
5. Participate in the quiz on following topics of mine legislation: Mines Act 1952, Mines Rules 1955, CMR 2017 & MMR 1961
6. Participate in the group discussion on following topics: Importance of safety, Causes and remedial measures of accidents and Zero accident potential working in mine.
7. View safety related videos regarding surface & underground various mining operations published by DGMS.
