DIPLOMA CURRICULUM OF

MINING ENGNEERING

(SECOND YEAR)

(3rd Semester)

(To be implemented from 2025-26)

Prepared by;

National Institute of Technical Teachers' Training & Research Kolkata

Block – FC, Sector – III, Salt Lake City, Kolkata – 700 106

Vetted by:

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Near Raj Bhawan, Unit-VIII, Bhubaneswar, Odisha

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PROGRAMME TITLE: MINING ENGINEERING (MIE)

SEMESTER – III

SL. No	Category of Course	Code No	Course Title	Teaching Scheme				Evaluation Scheme				Total Marks	Credits
				Pre-requisite	Contact Hours/ week			Theory		Practical			
					L	T	P	End Exam	Progressive Assessment	End Exam	Progressive Assessment		
1	Programme core	MIEPC201 (Th 1)	Surface Mining Technology	-	3	0	0	70	30	-	-	100	3
2		MIEPC203 (Th 2)	Mine Survey -I	-	3	0	0	70	30	-	-	100	3
3		MIEPC205 (Th 3)	Mine Geology -I	-	3	0	0	70	30	-	-	100	3
4		MIEPC207 (Th 4)	Mechanical Operation in Mines	-	3	0	0	70	30	-	-	100	3
5		MIEPC209 (Th 5)	Mine Machinery -I	-	3	0	0	70	30	-	-	100	3
6		MIEPC203 (Pr 1)	Mine Survey -I Lab	-	0	0	4	-	-	15	35	50	2
7		MIEPC205 (Pr 2)	Mine Geology -I Lab	-	0	0	4	-	-	15	35	50	2
8		MIEPC207 (Pr 3)	Mechanical Operation in Mines Lab	-	0	0	4	-	-	15	35	50	2
9		MIEPC201 (Pr 4)	Mine Machinery -I Lab	-	0	0	4	-	-	15	35	50	2
10	Summer Internship	SI201	Summer internship – I*	-	0	0	0	-	- - -	15	35	50	2
TOTAL					**15**	**0**	**16**	**350**	**150**	**75**	**175**	**750**	**25**

* 4 weeks after 2nd Semester

SURFACE MINING TECHNOLOGY

L	T	P		Course Code: MIEPC201(Th 1)	
3	0	0			
Total Contact Hours				**Theory Assessment**	
Theory		: 45Hrs	**Total Marks: 100**	End Term Exam	70
				Progressive Assessment	30
Pre Requisite		**: Nil**			
Credit		**3**		Category of Course : PC	

RATIONALE:

As a Mining Engineer, one has to develop the basic concepts and principles of winning and working in mines. Further, he should have basic knowledge of explosives for development of mines.

COURSE OUTCOMES:

At the end of the course, the student will be able to:

- Explain the concepts of choice of Opencast Mining.
- Define bench parameters and slope stability.
- Describe various compositions, properties of Explosives and Blasting accessories.
- Explain different drilling methods and blasting practices in Mines.
- Describe blasting techniques as per statutory provisions and safety provisions of magazine.

COURSE CONTENT DETAILS:

Unit No.	Content	Time Allotted (Hrs.)
I	**Choice of Opencast Mining:** Define Mine, Mining, Mineral, Ore, tenor, and mining engineering. Classify Surface Mining. State factors affecting choice of Open casting Mining method, Define stripping ratio and classify various stripping ratio, factor affecting stripping ratio. Define quarriable limit, State favorable conditions for mechanized Opencast Mines, State advantages and disadvantages surface mining, Define Box cut and its type. Determine the location of Box cut.	**9**
II	**Benching:** Determine bench parameters. Objective of benching in opencast mining. Factor affecting height, width of bench. **Slope Stability:** Define slope stability. Factors affecting slope stability. Types of slope failure. Causes and prevention of slope failure.	**9**

III	**Explosive and blasting accessories:** Define explosive, state constituents of explosives, properties and characteristics of explosives, Classify explosives, state composition and uses of explosives. Explain PMS and SMS Define permitted explosive and classify permitted explosive. Explain sheathed, equivalent sheathed and ultra-safe explosive. State properties of permitted explosives, State composition and constructional features of safety fuse, detonating fuse, detonating relay, igniter cord, nonel and raydet. Describe different types of detonators and uses, state advantages of delay detonators. State different types of exploder, its construction	**9**
	and safety features. Describe circuit tester stemming rod, crack detector knife, crimper.	
IV	**Drilling**: Different types of drilling used in surface mining. Explain different principles and methods of exploratory drilling in surface mining,. State different types of drill machine used in Opencast mining, Describe simple constructional features of churn drill, drills master, wagon drill and jack hammer, State D.T.H, Describe different types of drill bits in drilling. **Blasting practices in Mines**: Define Conventional Blasting. Describe preparation of charge. State procedure of firing shots. Direct and inverse initiation, stemming materials, water ampoules, wiring and firing of explosive. Define blasting efficiency. State and describe plaster shooting and pop shooting, toe blasting.	**9**
V	**Controlled Blasting Techniques as per statutory provision:** State and describe pre-splitting, cushion blasting, muffle blasting, coyote hole blasting, chambered hole blasting, directional blasting, Electronics Blasting System (EBS). **Magazines:** Describe layout and arrangement of different types of magazines, state their safety features.	**9**
Total		45

REFERENCES:

1. Surface Mining Technology S.K. DAS, Lovely Prakashan; 3rd edition, 2020.
2. Blasting Safety Manual, Pradhan, G.K., & Sandhu, M.S., 2002.
3. Blasting Practices in Mines S.K. DAS, Das, S.K., Lovely Prakashan, Dhanbad, 2001.
4. Elements of Mining Technology Vol. 2, D. J. Deshmukh, Denett & Co., 9th edition, 2016.
5. Surface Mining Vol. 1, G.B. Mishra, Dhanbad Publishers, 1979.
6. SME Mining Engineering Hand Book Vol.I & II, 2nd Edition, Society for Mining, 2019.

MINE SURVEY – I

L	T	P		Course Code: MIEPC203 (Th 2)	
3	0	0			
Total Contact Hours				**Theory Assessment**	
Theory		: 45Hrs	**Total Marks: 100**	End Term Exam	70
				Progressive Assessment	30
Pre Requisite		**: Nil**			
Credit		**3**		Category of Course : PC	

RATIONALE:

Before the starting of the actual mining operation, it is essential for the mining engineer to survey the piece of land, where mining operation is contemplated. This is not possible without the knowledge of mine surveying. In this context, Mine Survey-1 deals with the initial aspects of surveying.

COURSE OUTCOMES:

After completion of the course, the students will be able

- Explain the concepts of chain survey.
- Describe the principles of compass survey.
- Identify the fundamentals of plane table survey.
- Describe general methods of determining areas.
- Identify various leveling methods.
- Describe different methods of calculating ore reserves and application of theodolites in surveying.

Unit No.	Content	Time Allotted (Hrs.)
I	**Chain Survey: S**urvey conventional signs, abbreviations, Standards of lining, inking and coloring, selection of scales, principle of chain surveying, instruments and correctness, Ranging and chaining of a line, Errors in chaining, Obstruction while chaining, Chaining along a sloping ground, Use of optical square and line range and correctness, Offsets and their measurements, Reference sketches of stations. Procedure of chain surveying, Field booking and plotting of chain survey.	**9**
II	**Compass Survey:** Prismatic compass, its adjustments and use, True meridians, magnetic meridian, grid line meridian and arbitrary meridian, W.C.B. and Q.B. and conversion, Fore and back bearing and their conversion, Bearing angles, Local alteration, Local alteration and correction to the bearing, Closed and open compass surveying and its plotting, Field booking in compass and chain traverses, Adjustment of closing error in compass traversing, Surveyor compass(miner's dial),its adjustment and use, Prismatic compass with surveyor compass.	**9**
III	**Plane Table Survey:** Fundamentals of Plane Table Survey, Two point problems. Three point problems and its solution by tracing paper method, Advantages and disadvantages of plane table.	**6**
IV	**Computation of areas:** Methods of determining areas, Areas from offset to a base line using Mid ordinate rule, Average ordinate rule, Trapezoidal rule, Simpson's rule, Compute area by Planimeter and from graph paper.	6
V	**Leveling: B**enchmark M.S.L. Dumpy level, Adjust dumpy level, modern levels (Auto Level & etc.), and precise staff. Methods of leveling- Rise & fall method, height of instrument, Errors in ordinary levelling, Reciprocal leveling, subsidence leveling, setting out gradient, trigonometric leveling, geometrical leveling and physical leveling.	**6**
VI	**Calculation of Ore Reserves: R**eserves, Reserves by exploratory, Primary ore reserve by material balance method and decline curve method. **Theodolite: T**emporary and permanent adjustment of Theodolite. Principles of operation and different parts, Horizontal and Vertical angles, Setting of the instrument, Traversing with Theodolite.	9
	Total	**45**

REFERENCES:

1. Textbook of Surveying, B.C. Punmia Vol I & II, Laxmi Publications, New Delhi.
2. Textbook of Surveying, T.P Kanetkar, Griha Prakashan, Pune.

MINE GEOLOGY – I

L	T	P		Course Code: MIEPC205 (Th 3)	
3	0	0			
Total Contact Hours				**Theory Assessment**	
Theory		: 45Hrs	**Total Marks: 100**	End Term Exam	70
				Progressive Assessment	30
Pre Requisite		**: Nil**			
Credit		**3**		Category of Course : PC	

RATIONALE:

In majority of the cases, materials that need to be mined in order to reach the hidden treasure are rocks and minerals. It is therefore, essential for a mining engineer to have the basic knowledge of geology. In this course, aspects of Geology, Crystallography and Mineralogy are discussed, which are needed for the Mining engineers.

COURSE OUTCOMES:

At the end of the course, the students will be able to:

- Discuss the concept of Geomorphology.
- Identify the fundamentals of Igneous, Sedimentary and Metamorphic rocks along with their texture and structures.
- Explain the basics of structural geology.
- Demonstrate the elements of crystallography.
- Interpret the elements of mineralogy.

COURSE CONTENT DETAILS:

Unit No.	Content	Time Allotted (Hrs.)
I	**Physical Geology:** Geology for mining engineering: branches, scope and applications – internal structure of earth and composition – layers in atmosphere - Weathering and erosion, Erosional and depositional land forms produced by wind, Erosional and depositional land forms produced by river, Glacier and iceberg, Erosional and depositional features produced by glacier, Different type of moraine with sketches.	**10**
II	**Petrology:** Define Rock and mineral. Describe Igneous, Sedimentary and Metamorphic rocks, Various textures and structures found in Igneous rocks, Structures of sedimentary rocks, Structures in metamorphic rocks, Vacancies, Interstitials and impurities, Types and causes of line defects: Edge dislocation and screw dislocation, Effect of imperfection on material properties, Deformation by slip and twinning, Effect of deformation on material properties.	**12**
III	**Structural Geology:** Dip, True dip and apparent dip, Strike, Folds, Faults, Various types of faults, Unconformity, Various type of unconformity, Joints. Various joints.	**7**
IV	**Elements of Crystallography:** Crystal, Miller's indices, Symmetry elements and forms present in the normal class of isometric system.	**9**

V	**Elements of Mineralogy: M**ineral, Physical properties of minerals. Optical properties of minerals, Silicate structures, Minerals, Mineralogy, Physical properties of Olivine, Quartz, Feldspar and Pyroxene group of minerals.	**7**
	Total	**45**

REFERENCES:

1. Textbook of Geology, P.K Mukharjee, World Press Publications, 2013.
2. Textbook of Geology, G.B. Mohapatra, CBS Publishers, 2019.
3. H. H. Read F.R.S., Rutley's Elements of Mineralogy, Springer, 1970.
4. The Principles of Petrology, G.W. Tyrrel. 1978.
5. Structural Geology, M.P. Billings, AITBS Publishers, 2012.
6. Structural Geology of Rocks at Regions,. G. Davids, 3rd Edition, 2013.

MECHANICAL OPERATIONS IN MINES

L	T	P		Course Code: MIEPC207 (Th 4)	
3	0	0			
Total Contact Hours				**Theory Assessment**	
Theory		: 45Hrs	**Total Marks: 100**	End Term Exam	70
				Progressive Assessment	30
Pre Requisite		**: Nil**			
Credit		**3**		Category of Course : PC	

RATIONALE:

As Mining Engineers, it is essential to have the fundamental concepts of mechanical engineering, specially related to the working of machines that are used in mines. This course deals with the strength of materials, power transmission elements of hydraulics, compressed air and internal combustion engines.

COURSE OUTCOMES:

At the end of the course, the students will be able to:

- Explain the fundamentals of strength of materials.
- Identify the fundamentals of power transmission.
- Explain the basic elements of hydraulics.
- Identify the uses of compressed air.
- Explain the working of internal combustion engines.

COURSE CONTENT DETAILS:

Unit No.	Content	Time Allotted (Hrs.)
I	**Strength of Materials:** Cantilever with UDL over whole span, simple supported beam with concentration loading, Simple supported beam with UDL over whole span, Bending formula, Section modules, Section modules for beam sections of simple cases.	**9**
II	**Power Transmission**: Torsion and its effects, Application of torsion formula, Shaft couplings such as hydraulic and magnetic couplings, Belt, chain and rope Drive, Simple and compound gear train, Torque converters, Flywheel and governors, Watt, Porter and Proell governors.	**9**
III	**Elements of Hydraulics:** Properties of fluids, pressure of fluid and head, Working principles of various pressure measuring devices such as: Pieccometer tube, Continuity equation, Bernoulli's theorem, Venturimeter, Orifices, Discharge for rectangular orifices. Orifice and notch, Classification of notches, Discharge through notches, Laws of fluid friction, Loss of head due to friction (Darcy weisbach formula), Hydraulic gradient and energy gradient.	**9**
IV	**Compressed Air:** Compressed air as a power, Classification of Compressors,	**9**

	Working principle, Various methods of transmission, Storage of compressed air, Use of compressed air in mines, Working principle of pneumatic machines.	
V	**Internal Combustion Engines:** Various air cycles used in I.C Engines such as: OTTO Cycle, Diesel Cycle. Working principle of 2 stroke and 4 stroke petrol and diesel engines, I.H.P., B.H.P, Mechanical efficiency of I.C Engines. Applications of I.C Engines in Mining field.	**9**
	Total	**45**

REFERENCES:

1. Strength of Materials, Ramrutham, Dhanpat Rai Publishing Company (p) Ltd, New Delhi.
2. Applied Mechanics, Khurmi and Gupta, S Chand, New Delhi.
3. Hydraulic Fluid Mechanics and Fluid Machines, Ramrutham, Dhanpat Rai Publishing Company (p) Ltd, New Delhi.
4. Thermal Engineering, A.S. Sarao, Satya Prakashan, New Delhi.

MINE MACHINERY –I

L	T	P		Course Code: MIEPC209 (Th 5)	
3	0	0			
Total Contact Hours			**Total Marks: 100**	**Theory Assessment**	
Theory		: 45Hrs		End Term Exam	70
				Progressive Assessment	30
Pre Requisite		**: Nil**			
Credit		**3**		Category of Course : PC	

RATIONALE:

There are various types of machines and equipment used in mining operations. As a mining engineer, it is necessary for them to understand about the Machinery used during mining. This course is very helpful, which discusses about Mine Machinery.

COURSE OUTCOMES:

At the end of the course, the students will be able to:

- Describe the features, types, construction, uses and maintenance of wires.
- Describe different types of rope haulage.
- Describe constructional and safety features of cage and shaft fittings.
- Describe different profiles of winding drum and types of friction winding.
- Explain skip-winding arrangements.
- Draw various arrangements of pit top and pit bottom layouts.

COURSE CONTENT DETAILS:

Unit No.	Content	Time Allotted (Hrs.)
I	**Wire Ropes: W**ire ropes used in Mines, Constructional features of wire ropes and lay of wire ropes, Factor of safety, Nominal and actual factor of safety of wire ropes, Factors influencing the F.O.S, Efficiency of rope construction, space factor, cross sectional area rope. Factors affecting deterioration of ropes. Care and maintenance of ropes, Testing and examination of wire ropes, Splicing of wire ropes, Rope capel for haulage winding and recapping.	**9**
II	**Rope Haulage:** Transportation in mines by rope haulage, Types of rope haulage, Safety devices on rope haulage roadways, Different types of clips and couplings.	**6**
III	**Headgear: S**tate functions of headgear. Describe constructional features of headgear pulley. Define angle of fleet. **Cage and shaft fittings: C**age, cage suspension gear, detaching hooks, safety catch at headgear and keps, Types of guide, Rigid guide, flexible shoes, guide rope suspension and tensioning arrangement.	**6**
IV	**Winding drum: D**ifferent profiles of winding Drum, Different types of winding brake, Various types of safety devices on winding system. **Friction Winding: P**rinciple and constructional features of ground-mounted and tower-mounted koepe winder, Advantages & disadvantages of koepe winding. Multirope system of koepe winding.	**12**
V	**Skip winding:** Constructional features bottom discharge skip, Top discharge skip, Skip winding and cage winding.	**6**
VI	**Pit top & Pit bottom circuit layout: F**actors affecting pit top and pit bottom	**6**

	layouts, Different types of pit top and pit bottom car/tub circuit layouts.	
	Total	**45**

REFERENCES:

1. Mine Hoisting, M A Ramulu, White Falcon Self-Publishing Platform; 2nd edition, 2015.
2. SME Mining Engg Handbook, Littleton, Colo. : Society for Mining, Metallurgy, and Exploration, 1992.
3. Material Handling in Mines, IIT Kgp NPTEL Course Material, 2022.
4. Elements of Mining Technology Vol. 2, D. J. Deshmukh, Denett & Co., 9th edition, 2016.
5. Mine Transport, N.T Kerlin.
6. Universal Mining School Volume, T. S. Southern Ltd, 1883.

MINE SURVEY -I LAB

L	T	P		Course Code: AEPC211 (Pr 1)	
0	0	4			
Total Contact Hours				**Practical Assessment**	
Practical		: 60Hrs	**Total Marks: 100**	End Term Exam	15
				Progressive Assessment	35
Pre Requisite		**: Nil**			
Credit		**2**		Category of Course : PC	

RATIONALE:

Mine surveying is important to Mining engineers. In this course, fundamentals of Mine Survey are discussed. In the field of mining, it is required to have measurements, calculations and mapping at all stages from prospecting to exploitation and utilizing mineral deposits by both surface and underground working.

COURSE OUTCOMES:

At the end of the course, the student will be able to:

- Develop clear idea about Chain survey and Compass survey.
- Identify various components of Level and Theodolite along with their uses.
- Distinguish methods employed for measurement of horizontal and vertical angles.

COURSE CONTENT DETAILS:

Sl. No.	Topics for practice	Time Allotted (Hrs.)
I	**Chain Survey** • Ranging a line more than 100 m in length and measuring its correct length applying corrections. • Taking offsets of objects on both sides of a line. • Plotting the above details. • Overcoming obstructions in chaining. • Vision free, chaining obstructed (Pond, river) • Chaining free, vision obstructed (Raising ground) • Both vision and chaining obstructed (Building) • Measuring on sloping ground. • Chain surveying and plotting of small plot by triangulation.	**12**
II	**Compass Survey** • Finding bearing of line and applying check. • Closed traversing of a small plot with station (without intermediate filling) • Open traversing of a small length with few station (without offsets) • Plotting both the above traverses applying correction.	**12**
III	**Levels**: □ Temporary and permanent adjustment, sensitivity of bubble tube practice with different types of level(Auto Level & etc.)	**12**
IV	Temporary and permanent adjustment of theodolite.	**8**
V	Measurement of horizontal angle by reiteration and repetition methods.	**8**
VI	Measurement of vertical angle	**8**

	Total	**60**

REFERENCES:

1. Mine Surveying and Levelling Vol 1, S Ghatak, Lovely Prakashan, 2012.
2. Surveying & Levelling, B. C. Punamia, A.K. Jain, Arun Kumar Jain, 17th Edition, Laxmi Publications, 2016.
3. Surveying & Levelling, T.P. Kanetkar and S.V. Kulkarni, Pune Vidyarthi Girha Prakashan, 2017.
4. Mine surveying by F. Winniberg, Mining Publications, 1935.

MINE GEOLOGY -I LAB

L	T	P		Course Code: MIEPC213 (Pr 2)	
0	0	4			
Total Contact Hours			**Total Marks: 50**	**Practical Assessment**	
Practical		: 60Hrs		End Term Exam	15
				Progressive Assessment	35
Pre Requisite		**: Nil**			
Credit		**2**		Category of Course : PC	

RATIONALE:

In majority of the cases, materials that need to be explored comprise of rocks and minerals. It is therefore, essential for a mining engineer to have the basic knowledge regarding the composition, structure and texture of both rock and minerals.

COURSE OUTCOMES:

At the end of the course, the student will be able to

- Identify ore forming and rock forming minerals.
- Determine specific gravity of minerals by workers steel yard balance.
- Analyze thin section of minerals and rocks under microscope.
- Solve the structural geology problems
- Measure strike and dip in the field

COURSE CONTENT DETAILS:

Sl. No.	Topics for practice	Time Allotted (Hrs.)
I	Identification of rock forming and ore minerals in hand specimens	**8**
II	Determination of specific gravity by workers steel yard balance	**8**
III	Analysis of thin sections of minerals under the microscopes	**8**
IV	Analysis of thin sections of rocks under the microscopes	**12**
V	Study and sketching of models showing different types of faults, folds & their relation to topography	**12**
VI	Strike and dip measurement using Brunton Compass and Clinometer, Dip and Strike Problems.	**12**
	Total	**60**

REFERENCES:

1. Simmons & Schuden guide, Rocks and Minerals Cornelius S. Hurlbut. Jr. Dana's manual of Mineralogy, John Wiley and Sons, 1985.

MECHANICAL OPERATION IN MINES LAB

L	T	P		Course Code: MIEPC215 (Pr 3)	
0	0	4			
Total Contact Hours			**Total Marks: 50**	**Practical Assessment**	
Practical		: 60Hrs		End Term Exam	15
				Progressive Assessment	35
Pre Requisite		**: Nil**			
Credit		**2**		Category of Course : PC	

RATIONALE:

Mechanization is happening in mining sector and is vital for the growth of the mining industry. As a mining engineer, one should have some fundamental knowledge regarding the machines used in mines.

COURSE OUTCOMES:

At the end of the course, the student will be able to

- Identify the application of Bernouli's Theorem
- Determine velocity of air
- Determine volumetric efficiency of air compressor.
- Distinguish construction and working procedure of 2-stroke and 4-stroke diesel engine.
- Experiment involving the testing on I.C. Engine.

COURSE CONTENT DETAILS:

Sl. No.	Topics for practice	Time Allotted (Hrs.)
I	Verify Bernoulli's Theorem by using Bernoulli's Verification Apparatus.	**8**
II	Determine rate of flow through the venturimeter set-up.	**8**
III	Conduct Tensile test of a mild steel specimen and plot stress-stain curve, show salient points on it.	**8**
IV	Determine volumetric efficiency of Air compressor	**12**
V	Study of 2-Stroke and 4-Stroke diesel engines	**12**
VI	Conduct of I.C Engine Test - Conduct I/C engine testing on single cylinder diesel engine & find out I.H.P., B.H.P. & mechanical efficiency.	**12**
	Total	**60**

REFERENCES:

1. Strength of Materials, Ramrutham, Dhanpat Rai Publishing Company (p) Ltd, New Delhi.
2. Applied Mechanics, Khurmi and Gupta, S Chand, New Delhi.
3. Hydraulic Fluid Mechanics and Fluid Machines, Ramrutham, Dhanpat Rai Publishing Company (p) Ltd, New Delhi.
4. Thermal Engineering, A.S. Sarao, Satya Prakashan, New Delhi.

MINE MACHINERY -I LAB

L	T	P		Course Code: MIEPC217 (Pr 4)	
0	0	4			
Total Contact Hours			**Total Marks: 50**	**Practical Assessment**	
Practical		: 60Hrs		End Term Exam	15
				Progressive Assessment	35
Pre Requisite		**: Nil**			
Credit		**2**		Category of Course : PC	

RATIONALE:

It is imperative that a Mining Engineer should be thoroughly conversant with various types of machine used in mining operations.

COURSE OUTCOMES:

At the end of the course, the student will be able to

- Identify the basics of Wire rope, rope splicing & capeling.
- Describe the details about Safety hook, keps & rope guides.
- Explain about head gear structure, suspension gear & winding drum.

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COURSE CONTENT DETAILS:

Sl. No.	Topics for practice	Time Allotted (Hrs.)
I	Study of Wire rope.	**4**
II	Study of rope splicing.	**4**
III	Study of rope cappel.	**4**
IV	Study of safety hook.	**4**
V	Study of keps.	**4**
VI	Study of guide in shaft.	**4**
VII	Study of clips used in endless rope haulage.	**4**
VIII	Model Development of Headgear Structure.	**4**
IX	Model Development of Suspension Gear.	**8**
X	Model Development of different types of winding drum	**8**
XI	Model development of different types of safety devices used in haulage roadways.	**12**
	Total	**60**

References:

1. Mine Hoisting, M A Ramulu, White Falcon Self-Publishing Platform; 2nd edition, 2015.
2. SME Mining Engg Handbook, Littleton, Colo. : Society for Mining, Metallurgy, and Exploration, 1992.
3. Material Handling in Mines, IIT Kgp NPTEL Course Material, 2022.
4. Elements of Mining Technology Vol. 2, D. J. Deshmukh, Denett & Co., 9th edition, 2016.
5. Mine Transport, N.T Kerlin.
6. Universal Mining School Volume, T. S. Southern Ltd, 1883.

SUMMER INTERNSHIP – I

L	T	P		Course Code: SI201	
0	0	0			
Total Contact Hours				Assessment	
Practical		0	Total Marks: 50	End Term Exam	15
				Progressive Assessment	35
Pre Requisite		: Nil			
Credit		2		Category of Course : SI	

Duration: 3-4 weeks during summer vacation after 2nd Semester.

RATIONALE

Summer Internship - I is to offer a structured and practical learning experience that prepares individuals for their future careers, helps them make informed career choices, and equips them with the skills and knowledge necessary to succeed in their chosen field. This course provides opportunities to students for hands-on industry experience.

LEARNING OUTCOMES

After completion of the course, the students will be able to:

- Apply theoretical knowledge gained in their academic coursework to real-world situations.
- Enhance specific skills relevant to their field.
- Gain hands-on experience in a professional network by interacting with mentors and industry professionals.
- Manage time effectively.
- Clarify career goals.

DETAILED COURSE CONTENTS

SUGGESTED ACTIVITIES:

I Orientation:

- Introduction to the organization's mission, values, and culture.
- Familiarization with workplace policies, procedures, and safety guidelines.
- Orientation to the team and organizational structure.

II Project-Based Learning:

- Description of the main project or tasks the intern will be working on during the internship.
- Detailed project goals and objectives.
- Training and guidance on project-specific tools, technologies, or methodologies.

III Technical and Skill Development:

- Training sessions or workshops to enhance technical skills relevant to the internship role (e.g., programming languages, software tools, laboratory techniques).
- Soft skills development, including communication, teamwork, problem solving, and time management

IV Mentorship and Supervision:

- Regular meetings with a designated mentor or supervisor for guidance, feedback, and support.
- Mentorship objectives and expectations.

V Professional Development:

- Sessions on professional etiquette, networking, and building a personal brand

- Resume writing and interview preparation workshops.

VI Industry and Field-Specific Knowledge:

- Lectures, seminars, or presentations on industry trends, best practices, and emerging technologies.
- Guest speakers from the field to share insights and experiences.
- Field visit for practical exposures.

VII Reporting and Documentation:

- Training on how to document project progress, results, and findings.
- Practice in creating reports, presentations, or other deliverables.

VIII Ethics and Professionalism:

- Discussions on ethical considerations within the field.
- Scenarios and case studies related to ethical decision-making

IX Feedback and Evaluation:

- Regular performance evaluations and feedback sessions.
- Self-assessment and goal-setting exercises.

X Networking and Industry Exposure:

- Opportunities to attend industry conferences, webinars, or networking events.
- Encouragement to connect with professionals in the field.

NOTE

As per AICTE guidelines, in Summer Internship-I, students are required to be involved in Inter/ Intra Institutional Activities viz;

- Training with higher Institutions;
- Soft skill training organized by Training and Placement Cell of the respective institutions;
- contribution at incubation/ innovation /entrepreneurship cell of the institute;
- participation in conferences/ workshops/ competitions etc.;
- Learning at Departmental Lab/ Tinkering Lab/ Institutional workshop;
- Working for consultancy/ research project within the institutes and
- Participation in all the activities of Institute's Innovation Council for eg: IPR workshop/Leadership Talks/ Idea/ Design/ Innovation/ Business Completion/ Technical Expos etc.