

**Scheme of Teaching and Examination for  
1st Year of 3 Years Diploma in Mining Engineering**

Duration of Year : **30 Weeks**  
 Student Contact Hours : **35 Hrs/week**  
 Total Marks : **1600**  
 Effective from : 2017 -18 Session

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Communication Skills	M101	Theory	2			3	100	80	20	26	40
2.	Engineering Mathematics	M102	Theory	2			3	100	80	20	26	40
3.	Engineering Physics	M103	Theory	2			3	100	80	20	26	40
4.	Engineering Chemistry	M104	Theory	2			3	100	80	20	26	40
5.	Engineering Graphics	M105	Theory	1			4	100	80	20	26	40
6.	Mine Surveying-I	M106	Theory	2			3	100	80	20	26	40
7.	Computer Fundamental & Programming	M107	Theory	2			3	50	40	10	13	20
8.	Elements of Mining Geology	M108	Theory	2			3	100	80	20	26	40
9.	Elements of Mining Technology	M109	Theory	2			3	100	80	20	26	40
10.	Engineering Physics- Prac	M110	Practical			2	4	100	80	20	26	40
11.	Engineering Chemistry-Pract	M111	Practical			2	4	100	80	20	26	40
12.	Mine Surveying-I	M112	Practical			2	4	50	40	10	13	20
13.	Elements of Mining Geology practice	M113	Practical			2	4	50	40	10	13	20
14.	Engineering Graphics	M114	Sessional			2		100	60	40		50
15.	Computer Fundamental –Pra	M115	Sessional			2		50	30	20		25
16.	Elements of Mining Technology	M116	Sessional			2		100	60	40		50
17.	Workshop Practice	M117	Sessional			2		100	60	40		50
18.	Professional practices I	M118	Sessional			2		100	60	40		50
Total Hours of Teaching per week :				17		18	35					

Total Marks :                      Theory :                      Practical :                      Sessional :                      —  
L :                      Lecture, T :                      Tutorial P :                      Practical

- Note:
1. Period of Class hours should be of 1 hrs duration as per AICTE norms.
  2. Five (5) Hrs every week has been marked for students for Library and Student Centered Activities.
  3. Drawing / Graphics / Practical / Sessional examinations will be held at parent institution.
  4. Board will depute examiner for Practical examination.
  5. Regarding sessional examination the parent institution will form a three member committee and this committee will examine the sessional records and hold viva of the examinee for 60 % marks allotted to the subject. Marks for remaining 40 % will be provided by the Faculty concerned on the basis of evaluation of each job / work throughout the semester.
  6. Practical Training of 12 weeks shall be started after completion of 1<sup>st</sup> Year annual examination (Mandatory training for the partial fulfillment of Diploma).

**Course Name : 03 Years Diploma Mining Engineering**

**Year : First**

**Subject Title : Communication skills-I**

**Subject Code : M101**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
TH			100	80	20	26	40	3 Hrs

**NOTE:**

**Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.**

**RATIONALE:**

The comprehensive knowledge of communication and communication skill is essential for role of technicians in industry. Diploma pass outs are key persons between workforce and management and they need to be most effective in communication skills. The communication often includes grammar of the language in practice which is these days English. The inhouse practice before the faculty as part of scheme will develop the abilities in students a practical aspect of effective communication. Further exercises have been included for improving oral communication. Practical exposure gives a comprehensive communication skill effectiveness.

**OBJECTIVES:**

1. Comprehend the given passage
2. Answer correctly the questions on seen and unseen passages
3. Increase the vocabulary
4. Apply rules of grammar for correct writing

**CONTENTS: Theory**

Name of Topic	Hours	Marks
<b>PART : 1 TEXT</b> <ul style="list-style-type: none"><li>• Comprehension- Responding to Questions from text (Spectrum)</li><li>• Vocabulary-Understanding meaning of new word from text.</li><li>• Identifying part of Speech from text.</li></ul>	05	08

<p>PART-II : Application of Grammar</p> <ul style="list-style-type: none"> <li>• Verbs</li> <li>• Tense</li> <li>• Do as directed (active/passive, Direct/Indirect, affirmative/negative/assertive/interrogative, question tag, remove too, use of article, preposition, conjunction, punctuation)</li> <li>• Correct the errors from the sentences.</li> </ul>	05	08
<p>PART-III : Paragraph Writing</p> <ul style="list-style-type: none"> <li>• Types of Paragraph (Narrative, Descriptive, Technical)</li> <li>• Unseen passage for Comprehension.</li> </ul>	05	06
<p>PART-IV : Vocabulary Building.</p> <ul style="list-style-type: none"> <li>• Synonyms</li> <li>• Antonyms</li> <li>• Homophones</li> <li>• Use of Contextual word in a given Paragraph</li> </ul>	05	06
<p>PART-V : Soft Skill Development</p> <ul style="list-style-type: none"> <li>• Speaking Skill</li> <li>• Introduction to Group Discussion</li> <li>• Process of Group Discussion</li> <li>• Leadership skill</li> <li>• Instant public speaking</li> </ul>	05	06
<p>PART-VI Etiquettes &amp; Body Language</p> <ul style="list-style-type: none"> <li>• Telephone etiquettes listening/speaking</li> <li>• Problems of telephonic Conversation</li> <li>• Verbal/ oral etiquettes</li> <li>• Physical appearance</li> <li>• Eye Contact/Body Language</li> <li>• Group Discussion</li> </ul>	05	06
<p>PART-VII Introduction to communication:</p> <ul style="list-style-type: none"> <li>• Definition, communication cycle.,</li> <li>• The elements of Communication: sender- message – channel- Receiver – Feedback.</li> <li>• Concept of Communication Process.</li> <li>• Stages in the process: defining the context, knowing the audience, designing the message, encoding, selecting proper channels, transmitting, receiving, decoding and giving feedback. (Case lets.)</li> </ul>	05	06

<p>PART-VIII Types of communication</p> <ul style="list-style-type: none"> <li>• Formal Communication.</li> <li>• Formal: Types <ul style="list-style-type: none"> <li>a) Vertical Communication.</li> <li>b) Horizontal Communication.</li> </ul> </li> <li>• Informal: Types <ul style="list-style-type: none"> <li>Diagonal Communication.</li> </ul> </li> <li>• Verbal Vs Non-Verbal Communication.</li> <li>• Verbal: Types <ul style="list-style-type: none"> <li>a) Oral Communication.</li> <li>b) Written Communication.</li> </ul> </li> <li>• Non-Verbal: Types <ul style="list-style-type: none"> <li>a) Body Language.</li> <li>b) Graphic Language</li> </ul> </li> </ul>	05	06
<p>PART-IX Principles of Effective Communication :</p> <ul style="list-style-type: none"> <li>• Principles of Effective Communication. (One example each.)</li> <li>• Communication barriers &amp; how to overcome them.</li> <li>• Developing effective messages: Thinking about purpose, knowing the audience, structuring the message, selecting proper channels, minimizing barriers &amp; facilitating feedback. (Examples: Writing articles for newspapers, magazines.)</li> </ul>	05	06
<p>PART-X Non verbal- graphic communication:</p> <ul style="list-style-type: none"> <li>• Non- verbal codes: <ul style="list-style-type: none"> <li>A- Kinesics , B- Proxemics , C – Haptics</li> <li>D-Vocalics , E- Physical appearance.</li> <li>F -Chronemics , G –Artifacts. (One example each.)</li> </ul> </li> <li>• Aspects of Body Language. Types of Body Language. (One example each.)</li> <li>• Interpreting visuals &amp; illustrating with visuals like tables, charts &amp; graphs.</li> </ul>	05	06
<p>PART-XI Formal written skills :</p> <ul style="list-style-type: none"> <li>• Office Drafting: Circular, Notice, and Memo.</li> <li>• Job Application with resume.</li> <li>• Business correspondence: Enquiry, Order letter, Complaint letter, and Adjustment letter.</li> <li>• Report writing: Accident report, Fall in production, Progress Report,, Investigation Report.</li> <li>• Defining, Describing Objects &amp; Giving Instructions.</li> <li>• Defining Objects- Appearance, It's Use.</li> <li>• Describing Objects- Purpose, Components, Functions,</li> </ul>	05	08

Applications. <ul style="list-style-type: none"> <li>Giving Instructions- Precise, Directive, Imagistic Statements of a futuristic stance.</li> </ul>		
PART-XII Oral Skills : <ul style="list-style-type: none"> <li>Phonetics and Phonology Introduction Phonetics symbols Consonants/vowels/Diphthongs Stress and Intonation</li> <li>Discussion Skills Importance of group discussion Leadership skills Team management</li> <li>Presentation Skills Importance of presentation Planning of presentation Handling stage fright</li> <li>Mock Interview The Interview process Pre-Interview preparation Answering strategies</li> </ul>	05	08
<b>Total</b>	60	80

### **List of Assignment :**

- Building of Vocabulary  
25 words from the glossary given at the end of each chapter, to be used to make sentences.
- Applied Grammar  
Identify the various parts of speech and insert correct parts of speech in the sentences given by the teachers.
- Punctuation  
Punctuation 20 sentences given by the teachers.
- Tenses  
List 12 tenses and give two examples for each tense.
- Dialogue Writing  
Write at least two dialogues on different situations. (Conversation between two friends, conversation between two politicians etc.)
- Identifying the Error  
Identify the error in the sentences given by the teachers. (20 Sentences)
- Idioms and Phrases  
Use of Idioms and Phrases in sentences. (20 Examples)
- Biography  
Write a short biography on your favorite role model approximately. (250-300 words with pictures)
- Communication Cycle (With the Help of Diagram) + Any two communication situations to be represented with the help of Communication Cycle. (Use Pictures)

10. Communication Situations (List of 5 Communication situations stating the type of communication viz; Vertical, Horizontal, Diagonal.
11. Barriers That Hinder a Particular Communication Situation. (State the type of barrier, and how to overcome them). (04 Caselets)
12. Writing articles (two) in keeping with the parameters of developing effective messages. (Collect samples from newspapers, articles, Internet and paste them in the assignment.)
13. Business Letters: a) Job Application with Resume.  
 b) Enquiry Letter.  
 c) Order Letter.  
 d) Complaint Letter.
14. Non-Verbal Communication:
  - a) Body Language: Five Illustrations of appropriate use of Body Language used on the part of student in formal and Informal setups. (Example- formal setup- classroom)
  - b) Graphic Language: Five Illustrations of the use of Signs, Symbols, Colours, Maps, Graphs, Charts in day to day life.
15. Presentation Skills: Select topic (current issues) and ask students to give a class presentation as per the principles of effective communication and paste these topics as an assignment in the file.
16. Non-Verbal Codes: Kinesics, Physical Appearance, Haptics. (Collect five pictures per group of five students on the above mentioned non-verbal codes, analyse and discuss them in the class. Ask the students to paste these pictures along with explanation in their individual files.

### **Learning Resources :**

### **Reference Books :**

<b>Sl. No.</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
01.	Spectrum-A Text Book on English	-----	SBTE, Maharashtra
02.	Contemporary English Grammar structures and composition	David Green	Macmillan
03.	English for practical Purpose	Z.N. Patil et el	Macmillan
04.	English Grammar and composition	R.C.Jain	Macmillan
05	Grammer & Composition	Nesfield	
06	Technical English		Longman
07	English Workplace	Editor- Mukti Sanyal	Macmillan
08	Thesaurus	Rodgers	Macmillan

09	Dictionary	Oxford	Oxford University
10	Dictionary	Longman	Oriental Longman
11	Text book of Communication Skills.	SBTE, Mumbai.	SBTE, Mumbai.
12	Effective Technical Communication	M.Ashraf Rizvi	Tata McGraw Hill Companies.
13	Developing Communication Skills	Krushna Mohan, Meera Banerji	Macmillan
14	Communication Skills.	Joyeeta Bhattacharya	Reliable Series
15	Every ones guide to effective writing.	Jayakaran	Apple Publishing.

Web Sites for Reference :

<b>Serial No.</b>	<b>Website Address</b>
01	www.edufind.com
02	www.english_the_the_easy_eay.com
03	<a href="http://www.englishclub.com">www.englishclub.com</a>
04	<a href="http://www.english_grammar_lessons.com">www.english_grammar_lessons.com</a>
05	<a href="http://www.wikipedia.org/wiki/english_grammar">www.wikipedia.org/wiki/english_grammar</a>
06	Website: www.mindtools.com/page8.html-99k
07	Website: www.khake.com/page66htm/-72k
08	Website: www.BM Consultant India.Com
09	Website: www.letstak.co.in



**Course Name: 03 Years Diploma in Mining Engineering**

**Year : First**

**Subject Title: Engineering Mathematics**

**Subject Code: M102**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
03			100	80	20	26	40	3 Hrs

**NOTE:**

**1. Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.**

**Rationale:**

Mathematics provides foundation for all engineering subjects. In this paper “Engineering Mathematics” students will be taught basic facts, concepts and principles of mathematics as a tool to analyze engineering problems. The study this subject will help to develop the skills essential for new emerging avenues.

**Objective:**

The student will be able to acquire knowledge of mathematical terms, concepts and principles. They can acquire sufficient mathematical techniques and can develop the ability to apply mathematical methods to solve technical and day to day practical problems. This subject will also help the students to develop logical thinking, which is useful in comprehending the principles of all other subjects. Analytical and systematic approach towards any problem is developed through learning of this subject.

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
1	<b>ALGEBRA</b>		
	<b>1.1 Prerequisites</b> <b>Revision of</b> 1.1.1 Arithmetic, Geometric and Harmonic Progressions, 1.1.2 Formula of nth term and sum to n-terms of A.P. and G.P. 1.1.3 Expression of $\sum n^2$ and $\sum n^3$ . 1.1.4 Quadratic equations with real coefficients and relation between their roots & coefficient	1	1
	<b>1.2 Logarithms:</b> 1.2.1 Definition of logarithm (Natural and Common logarithm.) 1.2.2 Laws of logarithm 1.2.3 Examples based on 1.2.1 to 1.2.2	2	3
	<b>1.3 PARTIAL FRACTION</b> 1.3.1 Definition of polynomial fraction proper & improper Fractions and definition of partial fractions. 1.3.2 To Resolve proper fraction into partial fraction with denominator containing non repeated linear factors, repeated linear factors and irreducible non repeated Quadratic factors. 1.3.3 To resolve improper fraction into partial fraction.	2	3
	<b>1.4 DETERMINANT AND MATRICES.</b> <b>Determinant</b> 1.4.1 Definition and expansion of determinants of order 2 and 3. 1.4.2 Cramer's rule to solve simultaneous equations for 2 and 3 unknowns. <b>Matrices</b> 1.4.3 Definition of a matrix of order m X n and types of Matrices with examples. 1.4.4 Algebra of matrices such as equality, addition, Subtraction, scalar multiplication and multiplication. 1.4.5 Transpose of a matrix. 1.4.6 Minor, cofactor of an element of a matrix, adjoint of matrix and inverse of matrix by adjoint method.	6	8

	<b>1.4 BINOMIAL THEOREM</b> 1.4.1 Definition of factorial notation, definition of permutation and combinations with formula (without proof). 1.4.2 Derivation of simple identities and solution based on it. 1.4.3 Binomial theorem for positive index. 1.4.4 General term, Middle term, independent term and coefficient of $x^n$	3	4
	<b>TRIGONOMETRY.</b>		
	<b>2.1 REVISION</b> 2.1.1 Measurement of an angle (degree and radian). Relation between degree and radian. 2.1.2 Trigonometrical ratios of $0^\circ, 30^\circ, 45^\circ, 60^\circ, 90^\circ, 90^\circ \pm \theta, 180^\circ \pm \theta$ and $360^\circ \pm \theta$ 2.1.3 Fundamental identities.	1	1
2	<b>2.2 TRIGONOMETRIC RATIOS OF ALLIED, COMPOUND, MULTIPLE &amp; SUBMULTIPLE ANGLES</b> (Questions based on numerical computations, which can also be done by calculators, need not be asked particularly for allied angles).	5	6
	<b>2.3 Transformation formula of Product into sums or difference and vice versa, simple problems based on it</b>		
	<b>2.4 INVERSE TRIGONOMETRIC RATIOS</b> 2.4.1 Definition of inverse trigonometric, ratios, Principal values of inverse trigonometric ratios.  2.4.2 Relation between inverse trigonometric ratios.		
	<b>COORDINATE GEOMETRY</b>	8	10
	<b>3.1 POINT AND DISTANCES</b> 3.1.1 Distance formula, Section formula, midpoint, centroid of triangle. 3.1.2 Area of triangle and condition of collinearity.		
3	<b>3.2 STRAIGHT LINE</b> 3.2.1 Slope and intercept of straight line. 3.2.2 Equation of straight line in slope point form, slope-intercept form, two-point form, two-intercept form, normal form. General equation of line. 3.2.3 Angle between two straight lines condition of parallel and perpendicular lines. 3.2.4 Intersection of two lines. 3.2.5 Length of perpendicular from a point on the line and		

	perpendicular distance between parallel lines.		
	<b>3.3 CIRCLE</b> 3.3.1 Equation of circle in standard form, centre – radius form, diameter form, two – intercept form. 3.3.2 General equation of circle, its centre and radius, simple problem		
	<b>VECTORS</b>	6	8
<b>4</b>	4.1 Definition of vector, position vector, Algebra of vectors (Equality, addition, subtraction and scalar multiplication) 4.2 Dot (Scalar) product with properties. 4.3 Vector (Cross) product with properties.		
<b>05</b>	Function, Limit and Continuity  <b>Function</b>  5.1.1 Definitions of variable, constant, intervals such as open, closed, semi-open etc.  5.1.2 Definition of Function, value of a function and types of functions, Simple Examples.  5.1.3 Definition of sinh x, cosh x and tanh x and some hyperbolic identities.  <b>5.2 Use the concepts of Limit and Continuity for solving the problems</b>  5.2.1 The concept and meaning of $\lim_{x \rightarrow a} f(x) = l$ and the properties of limits.  5.2.2 Mention the Standard limits $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}$ , $\lim_{x \rightarrow 0} \frac{\sin x}{x}$ , $\lim_{x \rightarrow 0} \frac{\tan x}{x}$ , $\lim_{x \rightarrow 0} \frac{a^x - 1}{x}$ , $\lim_{x \rightarrow 0} \frac{e^x - 1}{x}$ , $\lim_{x \rightarrow 0} (1 + x)^{\frac{1}{x}}$ , $\lim_{x \rightarrow \infty} \left(1 + \frac{1}{x}\right)^x$ etc.  5.2.3 Evaluate the limits of the type $\lim_{x \rightarrow \infty} \frac{f(x)}{g(x)}$  5.2.4 Simple example on Limits of algebraic, trigonometric, exponential and logarithmic functions.  5.3 Concept of continuity of a function at a point and in interval with some examples related to “whether a given function is continuous or not”.	8	10

<b>06</b>	<p><b>6. Differentiation and its meaning in engineering situations</b></p>	10	16
	<p>6.1 Concept of derivative of a function <math>y = f(x)</math> from first principle as  <math display="block">\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}</math> And standard notations to denote the derivative of a function.</p>		
	<p>6.2 Derivatives of elementary functions like <math>x^n</math>, <math>a^x</math>, <math>e^x</math>, <math>\log x</math>, <math>\sin x</math>, <math>\cos x</math>, <math>\tan x</math>, <math>\sec x</math>, <math>\operatorname{cosec} x</math>, <math>\cot x</math> and inverse circular function using the first principles.</p>		
	<p>6.3 Rules for differentiation of sum, difference, scalar multiplication, product and quotient of functions with illustrative and simple examples.</p>		
	<p>6.4 Differentiation of a function of a function (Chain rule) with illustrative examples such as  (i) <math>\sqrt{t^2 + \frac{2}{t}}</math> (ii) <math>x^2 \sin 2x</math> (iii) <math>\frac{x}{\sqrt{x^2 + 1}}</math> (iv) <math>\log(\sin(\cos x))</math>.</p>		
	<p>6.5 Derivatives of Inverse Trigonometric functions and some examples using the Trigonometric transformations.</p>		
	<p>6.6 Differentiation of a function with respect to another function and also differentiation of parametric functions with examples.</p>		
	<p>6.7 Derivative of some simple hyperbolic functions (without proof).</p>		
	<p>6.8 Differentiation of implicit function with examples.</p>		
	<p>6.9 Differentiation of Logarithmic function with examples like <math>[f(x)]^{g(x)}</math>.</p>		
	<p>6.10 Concept of higher order derivatives (second and third order) with examples.</p>		
<p>6.11 Concept of function of several variables. Partial differentiation and difference between the ordinary and partial derivatives with simple examples.</p>			

<b>07</b>	<b>7. Applications of the Differentiation</b>	8	10
	7.1 Geometrical Meaning of Derivatives		
	7.1.1 State the geometrical meaning of the derivative as the slope of the tangent to the curve $y=f(x)$ at any point on the curve.		
	7.1.2 Concept of slope of tangent. Equation of tangent and normal to the curve $y=f(x)$ at any point on it.		
	7.1.3 Angle between two curves with illustrative examples.		
	7.2 Use Derivatives to find extreme values of functions.		
	7.2.1 Concept of increasing and decreasing functions.		
	7.2.2 Explain the conditions to find points where the given function is increasing or decreasing with illustrative examples.		
	7.2.3 Extreme values (maxima or minima) of a function of single variable - simple problems yielding maxima and minima.		
	7.3 Concept of Derivatives as Rate Measure		
7.3.1 Problems based on Rates and Motion			
7.4 Use Derivatives to find Radius of Curvature.			
		60	80
Total			

**Tutorial:** Tutorials are to be used to get enough practice for solving problems. It is suggested that in each tutorial at least five problems to be solved.

**Learning Resources:**

**Books:**

Sr. No	Title	Authors	Publications
1	Mathematics: A Textbook for Class XI Part I &II	National Council of Educational Research and Training	
2	Mathematics: A Textbook for Class XII Part I &II	National Council of Educational Research and Training	
3	Mathematics for Class XI Volume I and II	R. D. Sharma	Dhanpat Rai Publication, New Delhi.

4	Mathematics for Class XII Volume I and II	R. D. Sharma	Dhanpat Rai Publication, New Delhi.
5	Higher Engineering Mathematics	B.S Grewal	Khanna Publication, New Delhi
6	Senior Secondary School Mathematics for XI & XII.	R S Agarwal	Bharti Bhawan

**Note:**

In board examination, question setter may be advised to select 20% questions of objective, 30% of short type and remaining 50% of long type based on basic concepts, formula and calculations respectively.

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**Course Name : 03 Years Diploma in Mining Engineering**

**Year : First**

**Subject Title : Engineering Physics**

**Subject Code : M103/M110**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
02			100	80	20	26	40	3 Hrs
Practical		2	50	40	10	13	20	4 Hrs

**NOTE:**

**Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.**

**RATIONALE:**

Basic science forms the foundation of Engineering. In particular Physics provides fundamental facts, principles, laws, and proper sequence of events to streamline Engineering knowledge.

Subject objective:

This subject is classified under basic science. It describes basic facts, concepts, principles and techniques of scientific investigation of physical quantities and physical processes which are used in Core Technology & Technology subjects.

Chapter	Name of the Topic	Hours	Marks
01	<b>UNITS AND MEASUREMENTS</b> <b>1.1</b> Need of measurement and unit in engineering and science, definition of unit , requirements of standard unit, systems of units-CGS,MKS and SI, fundamental and derived quantities and their units <b>1.2</b> Definition of dimensions with examples, principle of homogeneity of dimensions, limitations of dimensions. <b>1.3</b> Definition of accuracy, precision and error, estimation of errors – absolute error, relative error and percentage error, rules and identification of significant figures.	<b>03</b>	<b>04</b>



	<b>(Numericals on percentage error and significant figures)</b>		
02	<b>MECHANICS</b> <b>2.1 Kinetics</b> Definitions of momentum, impulse, impulsive force, Statements of Newton's laws motion and with equations, Applications of laws of motion- Recoil of gun, Motion of two connected bodies by light inextensible string passing over smooth pulley, Motion of lift.  <b>(Numericals on impulse, recoil velocity and motion of lift.)</b>	<b>03</b>	<b>04</b>
	<b>2.2 Angular Motion</b> Definition of angular displacement, angular velocity and angular acceleration, relation between linear velocity and angular velocity, definition of simple harmonic motion (SHM), SHM as a projection of uniform circular motion on any diameter, equation of SHM, derivation of displacement, velocity and acceleration of a body executing SHM.	04	<b>05</b>
03	<b>Work, Power, Energy</b> Definition of work, power and energy, equations for P.E. & K.E., Work-Energy principle, Representation of work by using graph, work done by a torque (no derivation)  <b>(Numericals on work, potential and kinetic energy)</b>	<b>03</b>	<b>04</b>
4	<b>GENERAL PROPERTIES OF MATTER</b> <b>4.1 Elasticity</b> Deforming force, restoring force, elastic and plastic body, stress and strain with their types. elastic limit, Hooke's law, Young's modulus, bulk modulus, modulus of rigidity and relation between them (no derivation). <b>(Numerical on stress, strain and Young's modulus)</b>	<b>03</b>	<b>04</b>
	<b>4.2 Surface Tension.</b> Molecular force, cohesive and adhesive force, Molecular range , sphere of influence, Laplace's molecular theory, Definition of surface tension and its S.I. unit, angle of contact, capillary action with examples, shape of meniscus for water and mercury, relation between surface tension , capillary rise and radius of capillary ( no derivation),effect of impurity and temperature on surface tension <b>(Numerical on relation between surface tension, capillary rise and radius)</b>	<b>02</b>	<b>03</b>

	<p><b>4.3 Viscosity</b>  Definition of viscosity, viscous force, velocity gradient, Newton's law of viscosity, coefficient of viscosity and its S.I. unit, streamline and turbulent flow with examples, critical velocity, Reynolds's number and its significance, derivation of viscous force for free fall of spherical body through viscous medium, upthrust, terminal velocity, Stoke's law (statement and formula).  <b>(Numerical on coefficient of viscosity, Reynolds number and Stoke's formula)</b></p>	02	03
5	<p><b>HEAT</b>  <b>Transmission of heat and expansion of solids:</b>  Three modes of transmission of heat -conduction, convection and radiation, good and bad conductor of heat with examples, law of thermal conductivity, coefficient of thermal conductivity and its S.I. unit, Definition of linear, aerial and cubical expansion and relation between them. (no derivation)  (Numericals on law of thermal conductivity, and coefficients of expansions)</p>	03	04
6	<p><b>6.1 SOUND</b>  Definition of wave motion, amplitude, period, frequency, and wavelength, relation between velocity, frequency and wavelength, longitudinal and transverse wave, definition of stationary wave, node and antinode, forced and free vibrations, definition of resonance with examples, derivation of formula for velocity of sound with end correction.  <b>( Numericals on relation <math>v = n\lambda</math> and resonance)</b></p>	04	05
	<p><b>6.2 Acoustics of Building</b>  Acoustics-concept and definition, Intensity and loudness of sound, echo, Reverberation standard reverberation time, Sabine's formula, Conditions for good acoustics, Factors affecting Acoustical planning of auditorium.    <b>(Numericals on Sabine's formula)</b></p>	03	04
7	<p><b>7.1 Properties of light</b>  Reflection, refraction, Snell's law, physical significance of refractive index, definition of dispersion of light along with ray diagram.  <b>(Numericals on refractive index)</b></p>	02	03
	<p><b>7.2 Fiber Optics</b>  Introduction, Total internal reflection, critical angle, acceptance angle. Structure of optical fiber, Numerical Aperture, Fiber optic materials, Types of optical fibers, Applications in communication systems.    <b>(Numerical on critical angle, numerical aperture)</b></p>	04	5

8	<p><b>8.1- Electric field</b></p> <p>Electric charge, Coulomb's inverse square law, Definition of unit charge, Electric field, Electric lines of force and their properties, Electric field intensity, Electric flux, Electric flux density.</p> <p><b>(Numericals on Coulombs law, Electrical Intensity)</b></p>	04	5
	<p><b>8.2 Electric Potential</b></p> <p>Concept of potential, Definition and unit, Potential due to point charge using integration method, Potential difference between two points, Definition of dielectric strength and breakdown potential.</p> <p><b>(Numericals on electric potential)</b></p>	04	5
9	<p><b>9.1 Modern Physics</b></p> <p><b>9.1.1 Band Theory of Solids</b></p> <p>Energy levels in solids, Valence &amp; conduction bands, forbidden gap, Conductors, Semiconductors and Insulators, Intrinsic and Extrinsic Semiconductors, p-type and n-type semiconductors, P-N junction diode-forward and reversed biased characteristics.</p> <p><b>(No Numericals)</b></p>	04	5
	<p><b>9.1.2 Photo electricity</b></p> <p>Concept of photon, Plank's hypothesis, properties of photon, photo electric effect, Laws of photoelectric effect, work function, Einstein's photoelectric equation( no derivation), Basic Concept of Solar Energy.</p> <p><b>(Numericals on Energy of photon, work function, photoelectric equation)</b></p>	04	4
	<p><b>9.1.3 LASER</b></p> <p>Properties of laser, Characteristics and applications of laser.</p>	02	4
	<p><b>9.1.4 X-rays</b></p> <p>Introduction to X-rays, production of X-rays using Coolidge tube, minimum wavelength of X-rays, properties and applications. of X-rays</p> <p><b>(Numericals on minimum wavelength of x-rays)</b></p>	02	03

	<b>9.1.5 Introduction to nanotechnology</b> Definition of nanoscale, nanometer & nanoparticle, applications of nanotechnology- electronics, automobiles, medical, textile, cosmetics, environmental, space and defence.	02	03
10	<b>Non- Conventional Sources of energy</b> Introduction- Non Renewable and renewable (Alternate) energy sources, Examples- Solar Energy, Wind Energy, Tidal Energy, Geo-Thermal Energy and Bio-Mass. Advantages and disadvantages of renewable energy.	02	03
	<b>Total</b>	60	80

**List of Experiments:**

1. To use Vernier Callipers for the measurement of dimensions of given object.
2. To use Micrometer Screw Gauge for the measurement of dimensions (Length, Thickness, Diameter) of given object.
3. To use spherometer for the measurement of thickness of a given glass piece.
4. To determine time period of oscillation of compound bar pendulum and calculate acceleration due to gravity (g).
5. To calculate Young's modulus of elasticity of steel wire by vernier method
6. To study capillary phenomenon and to verify that the height of liquid in capillary is inversely proportional to the radius of capillary
7. To determine coefficient of viscosity of given liquid using Stoke's Method
8. To determine the velocity of sound by using resonance tube.
9. To calculate the Linear Thermal coefficient of expansion for copper by using pullinger's apparatus.
10. To determine refractive index of a glass using glass slab by pin method. ( $\sin i / \sin r = \mu$ ).
11. To calculate refractive index of material of prism using spectrometer device.
12. To verify Total Internal Reflection (TIR) phenomenon for given glass slab and to calculate critical angle of incidence.
13. To measure the numerical aperture the plastic fibre using 660 nm wavelength LED.
14. Verification of Ohm's Law.
15. To verify inverse square law by using photoelectric cell.
16. To determine I-V characteristics of P-N junction Diode.

REFERENCE :

Sl. No.	Author	Title	Publisher
01	VP Bhatnagar	I.Sc. Physics Volume I & II	Pitamber Publication Co. New
02	ArthurBeiser	Appliedphysics	TataMcGraw-Hill
03	R.K.Gaur and S.L.Gupta	EngineeringPhysics	DhanpatraiandSons.
04	Rensic and Halliday	Physics	Wileypublications
05	Dr.S.K.Kulkarni	Nanotechnology-principles	Capitalpublishingcompany
06	S.K.Gupta	ABC of Physics	Modern Publisher New Delhi
07	A. S. Vasudeva	Senior Practical Physics	S.K. Kataria & Sons.
08	E. ZEBROWSKI	Physics For Technicians	TATA MCGRAW HIL
09	H. H. LAL, B. K.	Applied Physics	TATA MCGRAW HILL
10	A Kumar	Core Physics- I & II	Bharti Bhavan
11.	K.L. Gomber & K. L Gogia	Pradeep's Fundamental Physics- XI & XII	Pradeep Publication
12.	V. K. Mehta & Rohit Mehta	S. Chand's Principles of Physics- XI & XII	S. Chand Publication
13	S.K Sharma	Dinesh New Millennium Physics- XI & XII	Dinesh Publication



**Course Name : 03 Years Diploma in Mining Engineering**

**Year : First**

**Subject Title : Engineering Chemistry**

**Subject Code : M104/M108**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
02			100	80	20	26	40	3 Hrs
Practical		2	50	40	10	13	20	4 Hrs

**NOTE:**

**Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.**

**Subject Objective :**

This subject is classified under the category of Basic science. It is intends to teach students the chemical properties of materials, selection of materials, and applications in various engineering field. This will provide the input for better understanding of other core technology and Technology subjects.

**Contents: Theory**

Chapter	Name of the Topic	Marks	Hours
<b>1.</b>	<b>ATOMIC STRUCTURE</b>	<b>05</b>	<b>04</b>
	1.1) Introduction of Atom		
	1.2) Fundamental Practicles of Atom-protons, neutrons, electrons,		
	1.3) Their mass, charge location		
	1.4) Definition of Atomic number, atomic mass, simple numerical problems based on atomic number and atomic mass number, Isotopes and Isobars definition, distinction and suitable examples		
	1.5) Bohr's theory of hydrogen atom.		
	1.6) Modern atomic structure		
	1.7) Orbits and orbitals, sub energy levels.		
	1.8) Pauli's exclusion principle		
	1.9) Hunds rule		
	1.10) Filling of electron in Sub-shells by Aufbau Principle (Z=1 -30).		
	1.11) Concept of variable valency with examples of 'ous' & 'ic' compounds		
	1.12) Nuclear stability		
1.13) Mass defect and binding energy –numerical problems.			
<b>2.</b>	<b>Electronic Theory of Valency</b>	<b>05</b>	<b>04</b>
	Duplet and Octet rule.		
	2.2) Valance electrons and Valency of the Element.		
	2.3) Electro positive electro negative and inert nature of elements.		
	2.4) Electro valency and co-valency.		
	2.6) Formation of electro valent and covalent compounds.		

3.	<p><b>Electro Chemistry</b></p> <p>3.1) Arrhenius theories of Ionization. Degree of Ionization, Strong and Weak electrolytes.</p> <p>3.2) Electrochemical series and their applications.</p> <p>3.3) Electrolysis of CuSO<sub>4</sub> solution using platinum electrodes, and copper electrodes.</p> <p>3.4) Applications of electrolysis, such as electroplating &amp; electro refining.</p> <p>3.5) Faraday's laws of electrolysis and numerical problems based on these laws.</p> <p>3.6) Conductivity of an electrolyte.</p> <p>3.7) Solubility product and common ion effect</p> <p>3.8) Specific conductivity</p>	08	06
4.	<p><b>Water</b></p> <p>4.1) Sources &amp; their physical and Chemical Characteristic of water.</p> <p>4.2) Purification of drinking water, Sedimentation , Coagulation , Filtration, Sterilization, (chlorination , Ozonization, ultra – violet rays, Boiling &amp; Aeration)</p> <p>4.3) Hard and soft water and causes of hardness.</p> <p>4.4) Types of hardness, degree of hardness in ppm of CaCO<sub>3</sub> Equivalent.</p> <p>4.5) Effect of hard water in Domestic and Industrial application. Effect of hard water n steam generation, boiler scales and sludge formation.</p> <p>4.6) Removal of hardness of water by</p> <ol style="list-style-type: none"> <li>Lime – soda process,</li> <li>Permutite process</li> <li>Ion exchange method.</li> <li>PH &amp; POH value of water and its application in domestic &amp; industrial purposes.</li> </ol>	08	06
5.	<p><b>Material</b></p> <p>5.1) Occurrence of metals, definition of metallurgy, ore and mineral.</p> <p>5.2) Processing of ore –stages of extraction of metal from it's ore.</p> <p>5.3) Extraction of Iron in the form of Pig iron in blast furnace. Reactions in the blast Furnace.</p> <p>5.4) Types of carbon steel, based on the percentage of carbon. Heat treatment to steel such as hardening, tempering, annealing &amp; normalizing.</p> <p>5.5) Physical properties and applications of some commonly used metals such as – Fe, Cu, Al, Cr, Ni, Sn, Pb, Zn, Co, Ag, W.</p> <p>5.6) Chemical properties of metals and their compounds.</p>	08	06
6.	<p>Alloys</p> <p>Definition of Alloys, types and purpose.</p> <p>6.2)Preparation of binary alloy by fusion method and compression method.</p> <p>6.4)A. Alloy, steel and their Applications:- effect of addition of C, Mn, V,W, Ni, Cr, Co, and Si. On steel</p> <p>6.5) Ferrous &amp; Non – ferrous alloys.</p>	05	04
7.	<p><b>Corrosion</b></p> <p>7.1) Definition of corrosion.</p> <p>7.2) Types of corrosion.</p> <p>7.3) Atmospheric corrosion.</p> <p>7.4) Mechanism of atmospheric corrosion.</p> <p>7.5) Types of oxide films.</p> <p>7.6) Factors affecting rate of atmospheric corrosion.</p>	05	04



	<p>7.7) Electro – chemical corrosion.</p> <p>7.8) Mechanism of electro-chemical corrosion.</p> <p>7.9) Galvanic cell corrosion, concentration cell, Oxidation Concentration cell, Corrosion.</p> <p>7.10) Factors affecting rate of electro – chemical corrosion.</p> <p>7.11) Protection of metals from corrosion.</p> <p>7.12) Processes of protection, cathodic protection, organic coating, Inorganic coating, and metallic coating.</p> <p>Metallic coating – hot, Dipping – Galvanizing, Tinning, cementation, Sherardizing, metal- cladding, spraying.</p>		
<b>8.</b>	<p><b>Paints &amp; Varnishes</b></p> <p>8.1) Principle constituents of paint, such as pigments, Vehicle, thinner. Drier, Extender, Plasticizer.</p> <p>8.2) Methods of application of paint such as brushing, spraying, dipping, roller, coating.</p> <p>8.3) Failure of paint film</p> <p>8.4) Characteristics of good varnishes</p> <p>Introduction of Enamels</p>	<b>05</b>	<b>04</b>
<b>9.</b>	<p><b>Lubricants</b></p> <p>Function of lubricants &amp; types of lubricants, solid, Semisolid, and liquid.</p> <p>9.2) Characteristics and properties of lubricant.</p> <p>9.3) Selection of lubricant for machines working under different conditions.</p>	<b>04</b>	<b>03</b>
<b>10.</b>	<p><b>Fuels</b></p> <p>Fuel, their types &amp; characteristics.</p> <p>10.2) Carbon, its bond formation, and types of hydrocarbon. Coalification, Analysis of coal. Proximate analysis and its importance</p> <p>10.3) Liquid fuel – crude petroleum and its refining by fractional distillation. Alcohol and power alcohol, Important products of petroleum and their applications.</p> <p>10.4) Gaseous fuel – Introduction of bio- gas. and petro- chemical gas (LPG), water gas and producer gas.</p>	<b>09</b>	<b>06</b>
<b>11.</b>	<p><b>Non-Metallic Materials</b></p> <p>Plastics: Formation of plastics (polymer) by addition such as polythene, polystyrene, PVC and Teflon and condensation such as Nylon &amp; Bakelite.</p> <p>11.2) Types of plastics. Thermosoftening and Thermosetting. Compounding of plastics by fillers, plasticizers, accelerators, pigments. Properties of plastics and their engineering applications.</p> <p>11.3) Rubber :</p> <p>a. Types of rubber. Natural &amp; Synthetic rubber</p> <p>b. Limitations of natural rubber.</p> <p>c. Vulcanization of rubber.</p> <p>d. Properties and engineering applications of synthetic rubber.</p> <p>11.4) Insulating Materials: Characteristics of good insulating materials.</p> <p>11.5) Glass, types and applications of glass – wool thermo Cole, asbestos.</p> <p>11.6) Cement , their chemical composition and properties.</p>	<b>10</b>	<b>08</b>
<b>12.</b>	<p>Pollution &amp; its control</p> <p>12.1) Pollution, types, its causes, impact and preventions.</p> <p>12.2) Air pollution, water pollution and land pollutions.</p> <p><b>12.3) Environmental Impact and their assessment.</b></p>	<b>08</b>	<b>05</b>
Total		<b>80</b>	<b>60</b>

List of Experiments:

**EXPERIMENT NO.1**

Determination of neutralization point of a weak acid and weak base using conductivity meter.

**EXPERIMENT NO. 2**

To determine the electrochemical equivalent of copper, by electrolysis of  $\text{CuSO}_4$  solution, using Copper plates as an electrodes.

**EXPERIMENT NO.3**

Purification of NaCl by dissolving impure NaCl in water and then recrystallization

**EXPERIMENT NO.4**

Precipitation titration of  $\text{BaCl}_2$  with  $\text{H}_2\text{SO}_4$  using conductivity meter

**EXPERIMENT NO. 5**

Determination of Chloride content in given sample of water.

**EXPERIMENT NO.6**

Determination of alkalinity

of given sample water i.e. volumetric determination of  $\text{OH}^-$ ,  $\text{CO}_3^{2-}$ ,  $\text{HCO}_3^-$

**EXPERIMENT NO.7**

Determination of degree of hardness, in terms of ppm of  $\text{CaCO}_3$ , of given sample of water, by EDTA method.

**EXPERIMENT NO.8**

Determination of pH value by Digital pH meter

**EXPERIMENT NO.9**

Qualitative analysis of seven solutions containing one acidic and one basic radical from following radicals.

$[\text{Pb}^{++}, \text{Cu}^{++}, \text{Al}^{+++}, \text{Fe}^{+++}, \text{Cr}^{+++}, \text{Zn}^{++}, \text{Ni}^{++}, \text{Mn}^{++}, \text{Ca}^{++}, \text{Ba}^{++}, \text{Mg}^{++}]$

$\text{NH}_4^+$ ,  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Cl}^-$ ,  $\text{Br}^-$ ,  $\text{I}^-$ ,

$(\text{SO}_4)^{--}$ ,  $(\text{NO}_3)^-$ ,  $(\text{CO}_3)^{--}$

**EXPERIMENT NO. 10**

Determination of percentage of Iron in given ferrous alloy by

(  $\text{KMnO}_4$  )

(Redox titration method)

**EXPERIMENT NO.11**

To determine the viscosity of oil lubricant.

**EXPERIMENT NO. 12**

To determine the acid value of oil lubricant by neutralizing with standard KOH Solution

**EXPERIMENT NO. 13**

Estimation of ash content in coal.

**EXPERIMENT NO . 14**

Estimation of moisture content in coal.

**EXPERIMENT NO.15**

Laboratory preparation of Bakelite by Phenol and Formaldehyde.

EXPERIMENT NO. 16

To determine CO and  $\text{CO}_2$  content in emission from petrol vehicle by using Auto exhaust analyzer.

**REFERENCES :**

<b>Author</b>	<b>Title</b>	<b>Year Of Publication &amp; Publisher</b>	<b>Place Of Publication</b>
M. N. Uppal	A Text - book of engineering Chemistry		
V. P. Mehta	A Text - book of polytechnic Chemistry		
Banswal, Mahajan and Mehta	A Text - book of Applied Chemistry		
Jain & Jain	Engineering Chemistry	Dhanpat Rai and Sons	

**year : First**

**Subject Title : Engineering Graphics**

**Subject Code : M105**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
01		2	100+100	80+60	20+40	26 TH	40+50	4 Hrs (TH)

**NOTE:**

**Internal marks for theory will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.**

**RATIONALE:**

Normally Graphical representation are used for expressing intents and contents. Engineering Graphics is the language of engineers. The concepts of Engineering Graphics are used to develop, express the ideas, and conveying the instructions which are used to carry out jobs in the field Engineering. The course illustrates the techniques of graphics in actual practice. This preliminary course aims at building a foundation for the further course in drawing and other allied subjects.

**OBJECTIVES:**

The student should be able to:-

- 1) Draw different engineering curves and know their applications.
- 2) Draw orthographic projections of different objects.
- 3) Visualize three dimensional objects and draw Isometric Projections.
- 4) Use the techniques and able to interpret the drawing in Engineering field.
- 5) Use computer aided drafting packages.

Chapter	Name of Topic	No. of Sheet	No. of Hr.	
			Theory	Practical
01.	1.1- Drawing Instruments and sheet layout 1.2- Letters and Numbers as per BIS: SP46-2003 1.3- Scale (Plane and diagonal scale)	02	01	06

02	2.1- 2.2- 2.3-	Curves and Conic Section To draw ellipse by directrix and arc of circle method To draw parabola by directrix and rectangle method To draw hyperbola by rectangle and directrix method.	01	02	06
03	3.1- 3.2-	Introduction to orthographic projection. Projection of point on principal, auxiliary and profile planes. Idea of shortest distance.	01	01	06
04	4.1- 4.2- 4.3-	Projection of straight line on principal plane in the following cases. Parallel to both H.P and V.P Inclined to one plane and parallel to other plane. Inclined to both plane.	01	02	06
05	5.1-	Projection of different simple shapes eg. Circle, Triangle, Rectangle, Pentagon, & Hexagon on principal plane (Inclined to one plane and to both planes)	01	02	06
06	6.1-	Projection of simple solid. Projection of Prism, Pyramid, Cone, Cylinder, and Cube with their axis inclined to one reference plane and parallel to other.	01	02	06
07	7.1- 7.2-	Section of simple solids with true shape of sectioned portion. Development of solid surfaces eg. Prism, Cylinder, Cone, Pyramid and Cubes.	01	02	06
08	8.1-	Isometric Scale and their use in drawing isometric views of single and compound solids. (Simple case only)	01	02	06
09	9.1-	Intersection of solids. Curves of intersection of the surfaces of the solids in the following case; a. Prism with Prism b. Cylinder with cylinder c. Prism with cylinder d. Cylinder with cone with different axis.	01	02	06

10	10.1-	Prospective Projection	01	02	04
11	11.1-	AutoCAD Basics, Layers, multi-layer images, graphic interfaces, different views to be drawn.	05	12	20
<b>Total--</b>			<b>16</b>	<b>40</b>	<b>80</b>

### Learning Resources:

#### a. Book-

Sl. No.	Author	Title	Publication
1.	N.D.Bhatt	Engineering Drawing	Charotkar Publishing House
2.	R.K.Dhawan	Engineering Drawing	S.Chand Co.
3.	K.R.Mohan	Engineering Graphics	Dhanpat Rai & Publication Co.
4.	P.J.Shah	Engineering Drawing	----
5.	P.S.Gill	Engineering Drawing	----
6.		Mastering AutoCAD	BPB Publication

**Course Name : 03 Years Diploma in Mining Engineering**

**Year : First**

**Subject Title : Mine Surveying-I**

**Subject Code : M106**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
02			100	80	20	26	40	3 Hrs
Practical		2	50	40	10	13	20	4 Hrs

**NOTE:**

**Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.**

**RATIONALE:**

The important job functions of mine surveyor include the activities of detailed surveying, plotting of survey data and setting out works.

It is therefore essential to give emphasis on the development of skills on using various survey instruments and their application in underground mines for preparation plans & sections of workings. In addition, for providing basic principles of surveying and levelling, it is necessary to arrange appropriate field exercises and small projects.

**OBJECTIVES:**

Student will be able to

1. Acquire skills of using various survey instruments.
2. Develop skills of preparation of mine plan & section.
3. Understand and apply principles and method of survey to conduct subsidence survey.
4. Carryout and suggest the repairs needed to survey instruments.
5. Understand and apply various statutory provisions of regulation while preparing mine plan & section.

## DETAILED CONTENTS:

CHAPTER	CONTENTS	Marks	Hrs
1.	<b>INTRODUCTION TO SURVEYING</b> 1.1 Definition of surveying, objects of surveying, Plane and Geodetic surveying. Classification & Basic principles of surveying. Chain Surveying : 1.2 Principle of chain surveying. Equipments in chain surveying, cross staff , optical square its principle and use. 1.3 Different operations in chain surveying, Ranging: direct & reciprocal ranging. Line ranger structure, principle of working and its use. Chaining: Chaining on flat & slopping ground, obstacle in chaining(No numerical). Errors in changing. Offsetting.	16	10
2.	<b>COMPASS SURVEYING</b> 2.1 The Prismatic & Surveyors compass, their Comparison. 2.2. Bearing of a line: Definitions: True & Magnetic Meridian; True and Magnetic bearings, Fore & Back bearings, Declination. Whole circle bearing system & Quadrantal Bearing system. Conversion of bearings from one system to other. Calculation of angles from bearings. Calculation of bearings from angles. 2.3. Local attraction: Sources, detection & its elimination. Magnetic Dip & Magnetic declination. Calculation of True bearings. 2.4. Traversing with compass: Closed and open traverse; Plotting a compass traverse; Checks for open & closed traverse; Closing error, Graphical adjustment of closing error.	16	10
3.	<b>PLANE TABLE SURVEYING</b> 3.1 Introduction, Plane table and its accessories, Temporary adjustments of Plane table, centering, levelling, orienting the plane table by method of back sighting by method of magnetic needle. 3.2 Methods of plane tabling Radiation, Intersection, Traversing, Resection method. 3.3 Advantages & disadvantages of plane table survey, Errors in plane table survey.	16	10



CHAPTER	CONTENTS	Marks	Hrs
4.	<p><b>LEVELLING</b></p> <p>4.1 Definitions of the terms used in Levelling. Concept of datum, Back sight, Foresight stations, change point, height of instrument. Dumpy and tilling level Construction and temporary adjustments. Levelling staff, their types. balancing of back sight and Fore sight distances. Holding and Reading the staff, simple and differential levelling, and booking of readings.</p> <p>4.2 Reduction of levels by Collimation system and by Rise &amp; fall system. arithmetic check, computation of missing readings.</p>	16	12
	<p>4.3 Classification of levelling: Differential, Reciprocal, and Fly levelling, Profile levelling, cross sectioning. Plotting of a profile and cross section.</p> <p>4.4 Difficulties in levelling, common mistakes in levelling. Permanent adjustments of Dumpy &amp; Tilling level. Automatic level (General idea only)</p> <p>4.5 Study and use of level Auto set level, Temporary adjustments.</p>		08
5.	<p><b>CONTOURING</b></p> <p>Introduction and concept, definitions, purpose, Characteristic of Contour line, contour interval, factors affecting contour interval, Horizontal equivalent. Methods of Locating contours Direct method, Indirect method. Interpolation of contours by estimation, arithmetical and by graphical method. Plotting of contour maps. Uses of contour map.</p>	16	10
	<b>Total</b>	80	60

### LIST OF PRACTICAL

1. Demonstration of measuring chain, tape, ranging rod, peg, arrow, optical square, line ranger.
2. Laying and ranging a chain line and taking offsets by tape on either side.
3. Chain and cross-staff survey for finding out area of a given field.
4. Perform temporary adjustment of prismatic compass and observing fore & back bearing and calculation of included angles from observed bearings.
5. Measure fore & back bearing of five sided closed traverse, identify stations affected by local attraction and calculate corrected bearings
6. Demonstration of plane table and accessories, temporary adjustment, locating points by radiation.
7. Methods of plane Tabling- orientation of plane table by back sighting and locating details by intersection method.
8. Demonstration of Dumpy level and tilting level.
9. Carrying out, Temporary adjustments of dumpy level and conduct simple levelling, recording readings in levelling book and apply arithmetic check.
10. Differential levelling with Dumpy level- recording in level book, reduction of levels by both methods, apply arithmetic check.

11. Fly levelling for carrying benchmark at a station at least 300 m away by tilting level.
12. Demonstration of auto level.
13. Draw Contour line of given area using level.
14. Generate Profile of given area using Contour data.
15. Draw 2D Contour of given data using available software.
16. Draw 3D contour of an area using available software.

**REFERENCE BOOKS :**

<b>Author</b>	<b>Title</b>	<b>Year of publication</b>	<b>Publisher</b>
T. P. Kanetkar & S. V. Kulkarni	Surveying and leveling Vol. I & II	1995	Pune Vidyapith Griha Prakashan Pune.
B.C. Punmia	Surveying-I & II		
Amarjit Aggarwal.	Surveying & Levelling	1992	H.Tata International Publication, Delhi- 51

**Course Name:- Diploma in Mining Engineering**

**Year: First**

**Subject Title: Computer Fundamentals & Programming**

**Subject Code; M107/M115**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
02	0		100	80	20	26	40	3 Hrs
Sessional		2	50	30	20		25	

**NOTE:**

**Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.**

**RATIONALE:**

**In Engineering Education role of computers and its knowledge is day by day increasing and every documentation and analysis requires basic fundamentals of computers. The accessibility to internet and presentation techniques are essential elements these days which is fully dependent on knowhow of computers irrespective of branches or discipline.**

**Every engineer is expected to work on software and have skill of programming. The fundamental language at this level is C.**

**CONTENTS : Theory**

Chapter	Name of Topic	Hr	Marks
1.	<b>Fundamentals of Computer</b> 1.1 Introduction 1.2 Type of Computer and units. 1.3 Different types of Memory used in Computer 1.4 Operating system , Types 1.5 Introduction to WINDOWS, UNIX, Android etc OS	4	2
2.	<b>Introduction to Office Suit</b> 2.1 Word Processing : Introduction, Starting Word Screen and its Components, Elementary Working with Word Processing Software. 2.2 Spread Sheet : Introduction, Starting Spread Sheet, Basics of Spreadsheet, Spread Sheet Screen and its Components, Elementary Working with Spread Sheet. 2.3 Power Point Presentation : Introduction, Starting	8	6

	PowerPoint Presentation, Basics of PowerPoint, PowerPoint Screen and Its Components, Elementary Working with PowerPoint Presentation.		
3.	<b>Introduction to Internet</b> 3.1 Internet , Computer Communication. 3.3 Protocols, WWW and Web Browsers. 3.4 Creating own Email Account. 3.5 Networking and types.	3	2
4	<b>Introduction to HTML and Software</b> 4.1 Introduction to HTML. Working of HTML 4.2 Creating and loading HTML pages, tags. 4.3 Structure of on HTML, Document, Stand Alone Tags. 4.4 Formatting text, Adding Images, Creating hyper Links, Tables. 4.5 Cyber security. 4.6 Computer virus.	6	4
5	<b>Emerging trends in IT</b> 5.1 Current IT Tools. 5.2 Social networking, mobile computing, cloud computing, Global positioning System. 5.3 Imminent Technology, Nano technology, DNA computing, Quantum Computers, Holographic Memory. 5.4 Introduction of IOT and IOE 5.5 Computer Application in various fields like Data analysis, database management, artificial intelligence.	4	2
6	<b>C Programming</b> <b>Basics of C</b> 6.1 Introduction to number system 6.2 Introduction to flowchart and algorithm 6.3 History of C, where C stands 6.4 C character set ,tokens ,constants ,variables, keywords 6.5 C operators (arithmetic, Logical, assignment, relational, increment and decrement, conditional, bit wise, special, operator precedence),C expressions data types. 6.6 Formatted input, formatted output. 6.7 <b>Decision making</b> 6.8 Decision making and branching if statement (if, if-else ,else-if ladder, nested if-else) Switch case statement ,break statement. 6.9 .Decision making and looping while, do, do-while statements	8	6

	for loop, continue statement.		
7	<p><b>Arrays and Strings</b></p> <p>7.1 Arrays</p> <p>Declaration and initialization of one dimensional, two dimensional and character arrays, accessing array elements.</p> <p>7.2 Declaration and initialization of string variables, string handling functions from standard library (strlen(), strcpy(), strcat(), strcmp()).</p>	8	6
8	<p><b>Functions, Structures</b></p> <p>8.1 Functions</p> <p>Need of functions, scope and life time of variables, defining functions, function call (call by value, call by reference), return values, storage classes. category of function (No argument No return value, No argument with return value, argument with return value), recursion</p> <p>8.2 Structures</p> <p>Defining structure, declaring and accessing structure members, initialization of structure, arrays of structure.</p>	8	6
9	<p><b>Pointers &amp; File Handling</b></p> <p>9.1 Understanding pointers, declaring pointer variable, initialization of pointer variable, accessing address of a variable, pointer expressions, Pointers arithmetic, pointers and arrays, array of pointers</p> <p><b>9.2 File Handling</b></p> <p>File System Basics, opening and closing of files, reading and writing in files, File opening modes, string I/O in files.</p>	8	6
<b>Total</b>		60	40

**Course Name : 03 Years Diploma in Mining Engineering**

**Year : First**

**Subject Title : Elements of Mining Geology**

**Subject Code : M108/M114**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
02			100	80	20	26	40	3 Hrs
Practical		2	50	40	10	13	20	4 Hrs

**NOTE:**

**Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.**

**DETAILED CONTENTS:**

CHAPTER	CONTENTS	HOURS	MARKS
1.	<b>GENERAL GEOLOGY</b> 1.1 Branches 1.2 Sub branches 1.2.1 Essential 1.2.2 Allied 1.3 Scope of geology 1.4 Origin of Earth 1.5 Age of Earth 1.6 Interior of Earth 1.7 Isostacy 1.8 Plate Tectonic Theory & Continental drift	10	12

2.	<p><b>MINERALOGY</b></p> <p>2.1 Elements of crystallography</p> <p>2.2 Characteristic symmetry elements</p> <p>2.3 Elements of crystal system</p> <p>2.4 Definition of Mineral</p> <p>2.5 Classification of Minerals.</p> <p>2.6 Physical and chemical properties of Minerals.</p> <p>2.7 Physical Chemical and Optical properties of following groups of rock forming minerals- Quartz, Pyroxene, Olivine, Amphobil,</p>	10	12
3.	<p><b>PETROLOGY</b></p> <p>3.1 Rock cycle and characteristics of various Rock types</p> <p>3.2 Igneous Rocks</p> <p>3.2.1 Origin</p> <p>3.2.2 Forms and structures</p> <p>3.2.3 Classification, occurrence &amp; uses.</p> <p>3.3 Sedimentary Rocks</p> <p>3.3.1 Origin &amp; classification</p> <p>3.3.2 Structure</p> <p>3.3.3 Occurrence &amp; uses</p> <p>3.4 Metamorphic Rocks</p> <p>3.4.1 Origin &amp; Classification</p> <p>3.4.2 Structure</p> <p><b>3.4.3</b> Occurrence &amp; Uses</p>	08	10

4.	<b>PHYSICAL GEOLOGY</b> 4.1 Weathering 4.1.1 definition of weathering 4.1.2 factors affecting weathering 4.1.3 types of weathering 4.1.4 Weathering & soil formation, weathering profile in various climatic region. 4.2 Land form produced by river, wind, glacier, ocean. 4.3 Earth quake 4.3.1 Definition of Earth Quake, epicenter, hypocenter. 4.3.2 Siesmic zones 4.4 Volcano 4.4.1 definition ,types & Land form	08	10
5.	<b>STRUCTURAL GEOLOGY</b> 5.1 Strike & Dip 5.1.1 Apparent Dip 5.1.2 True Dip 5.2 Dip-strike Problems 5.3 Folds-classification & Recognition in field 5.4 Faults- classification & Recognition in field 5.5 Unconformity- classification & Recognition in field 5.6 Joints and cleavages 5.7 Outlier and Inlier	08	12
6.	<b>COAL GEOLOGY</b> 6.1 Physical & chemical properties 6.2 Origin, occurrence and distribution 6.3 Ranks of coal 6.4 Banded constituents of coal. 6.5 Structural features of coal seam. 6.6 Commercial classification of coal.	08	12
7.	<b>GEOLOG ICAL MAPS</b> 7.1 Drawing of Geological section of maps. 7.2 Description of Geological maps. 7.3 characteristics of contour line.	08	12
	<b>Total</b>	60	80

#### LIST OF PRATICAL

1. Identification of Minerals in sets. Colour, Form, Cleavage, Fracture, Luster & Streak using Moh's scale of hardness.
2. Identification of Minerals on the basis of physical properties in hand specimens.
  - a. Quartz group
  - b. Feldspar group
  - c. Mica group
  - d. Amphibole group
  - e. Pyroxene group
  - f. Feldspathoid group
  - g. Miscellaneous silicate group
  - h. Non-silicates.
3. Identification of Igneous Rocks in Hand specimen.
4. Identification of sedimentary rocks in Hand specimen.



5. Identification of Metamorphic rocks in Hand specimen.
6. Drawing of Geological section Maps (any ten)
7. Draw profile from contour map along a given line using available software.
8. Identify the rank of given coal specimen.
9. Identify the structural band of coal specimen.
10. Measure the dip & strike of inclined plane using Brunton compass .
11. Measure the hinge & axial plane of fold in given model.

**REFERENCE:**

<b>AUTHOR</b>	<b>TITLE</b>	<b>YEAR OF PUBLICATION</b>	<b>PLACE OF PUBLICATION &amp; PUBLISHER</b>
P.K. Mukherjee	A text book of Geology	1986	The world press pvt. Ltd. Calcutta.
A.K. Dutta	Physical Geology	1962	A. K. Bose Ranchi.
S.W. Chiplonkar	Structural Geology		
Pravin singh	Engineering & General Geology	2016	Katsons, Delhi



**Course Name : 03 Years Diploma in Mining Engineering**

**Year : First**

**Subject Title : Elements of Mining Technology**

**Subject Code : M109/M116**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
02			100	80	20	26	40	3 Hrs
Practical		2	50	40	10	13	20	4 Hrs

**NOTE:**

**Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.**

**RATIONALE:**

The student of first year of Mining & Mine surveying must be aware of the Mineral Industry in the country and the Departments, which deal with mineral exploration, exploitation, safety, conservation and control of the mining industry. All technical definitions and terminologies connected with above are included here, as the students at this stage must be acquainted with these to cope up with the contents at later stage. Blasting is an important operation in all the mining operations. Knowledge of all the types of explosive, their properties and selection for different conditions/situation types of detonator/fuses etc is a must for them. Also it is essential for a mining engineer to understand systems of support of the mine workings. These all aspects have been included in the subject.

**OBJECTIVES:**

After undergoing the course of study the student shall be able to

1. State the various organizations engaged in coal and noncoal mining, their role and functions.
2. Understand various technical terms, operations involved in coal & noncoal mining.
3. Understand properties of explosives, procedure of conducting shot firing operation in underground coalmines with due regards to safety.
4. Understand the procedure of erection of temporary supports in underground coalmines.
5. State the major method of extraction of coal used in underground coal mines, their conditions of applicability.

**DETAILED CONTENTS:**

UNIT	CONTENTS	HOURS	MARKS
1.	<b>Introduction to Mineral &amp; Important Mining Organizations</b> 1.1 Definition of minerals.  1.2 Uses of important minerals mined e.g. Coal, Iron ore, copper, zinc, bauxite, gold, manganese, mica, uranium etc.  1.3 Important Organizations involved like DGMS, IBM, GSI, CIL, MECL, CIMFR, CMPDIL etc their role and functions.	10	12
2.	<b>Mining Terminology &amp; Definition.</b> 2.1 Common terminologies used in coal mining.  2.2 Common terminologies used in metal mining.  2.3 Common terminologies used in mine ventilation and environment.  2.4 Common terminologies used in mine supports. Simple definition, explanation, purposes and sketches.	08	10
3.	<b>Explosives &amp; Accessories</b> 3.1 Common explosive bases, Properties of Explosives, High Explosive & Low explosive, their comparison.  3.2 Permitted explosives their types, composition, properties, uses, advantages & disadvantages. Brand names of some commonly used explosive of each type.  3.3 A detonator, common types of detonators, plain detonators, instantaneous and delay action detonators their construction, uses, comparison etc. low tension & high-tension detonators.  3.4 Safety fuses, detonating cords, detonating relays. 3.5 Exploders	12	16

CHAPTER	CONTENTS	Marks	Hrs
4.	<p><b>Shot Firing</b></p> <p>4.1 Drilling patterns for shot firing on machine cut face, in stone drift etc.</p> <p>4.2 Shot Firing tools</p> <p>4.3 Face preparation for shot firing,</p> <p>4.4 Preparation of priming charge, charging of hole in coal and rock in under ground working only, Direct and inverse initiation, shot firing circuits, procedure of shot firing of holes in gassy mine, precautions. Simultaneous &amp; delay firing.</p> <p>4.4 Solid blasting, conditions to be satisfied before doing solid blasting, advantages of solid blasting, drilling patterns used with solid blasting</p>	10	16
5.	<p><b>Safety in Shot firing operation.</b></p> <p>5.1 Explosive required for blasting in coal/rock. Powder factor, detonator factor.</p> <p>5.2 Precaution to improve blasting results.</p> <p>5.3 Misfires, causes, remedy and method of relieving dealing with misfires, blown out shots, blown through shots causes and precautions.</p> <p>5.4 Purpose of stemming, Stemming materials used for shot firing, water ampoules for stemming.</p> <p>5.5 Storage of explosives, Magazines</p> <p>5.6 Disposal of outdated explosives.</p>	10	12
6.	<p><b>Introduction to coal mining method</b></p> <p>6.1 Classifications of method of working</p> <p>6.1.1 Board &amp; Pillar</p> <p>6.1.2 Open cast method.</p> <p>6.1.3 Long wall.</p> <p>6.2 Applicability condition for selection of each methods of working. Layout of each method.</p> <p>6.3 Advantages &amp; disadvantages</p>	10	14
	<b>Total</b>	60	80

**LIST OF PRACTICAL**

1. Erection of prop support At the face and incline road Ways.
2. Settings of cog support at junctions.
3. Setting of Cross Bar in the gallery.
4. Withdrawal of supports by Using Sylvester machine.
5. Demonstration of different Types of permitted Explosives Cartridges.
6. Demonstration of Instantaneous Electric Detonator

7. Demonstration of delay Detonator used for Shot firing in underground Mines.
8. Demonstration of shot Firing tools.
9. Demonstration of single Shot and multi shot exploder.
10. Study of different Drill hole patterns used For blasting in stone drifts
11. Demonstration of Preparation of Priming Cartridge.
12. Demonstration of methods of Charging of holes (Direct & Inverse initiation) for Blasting in underground Mines.
13. Demonstration of various Shot firing circuits.
14. Detection of misfire Shot and dealing with The misfire.
15. Sketch and Specifications Of explosive magazine

**REFERENCE:**

<b>Author</b>	<b>Title</b>	<b>Year of Publication</b>	<b>Publisher</b>
G.K. Pradhan	Explosive and Blasting Techniques	1996	Mintech publication Bhubaneshwar.
S.K. Das	Explosives and Blasting Techniques	1993	Lovely prakashan Dhanbad.
D.J. Deshmukh	Mining Technology Vol.- I	1995	Central techno publication, Nagpur

**Course Name : 03 Years Diploma in Mining Engineering**

**year : First**

**Subject Title : Workshop Practice**

**Subject Code : M116**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
		2	100	60	40	--	50	---

**Rationale:**

Engineering diploma technician is expected to know basic workshop practice. like Wood working, Sheet metal. The students are required to identify, operate, control various machines, select and use various tools and equipments related to Wood working and sheet metal processes together with exposure to fabrication soldering and joint making of various types.

**Objectives:**

The student will able to

- Know basic workshop processes.
- Read and interpret job drawing.
- Identify, select and use various marking, measuring, holding, striking and cutting tools & equipments.
- Operate, control different machines and equipments.
- Inspect the job for specified dimensions
- Produce jobs as per specified dimensions.
- Adopt safety practices while working on various machines.

**CONTENTS:**

Sr. No	Details Of Theory Contents	Jobs	Practice(hr)
01	<b>CARPENTRY SHOP</b> 1. Introduction. 2. Various types of woods. 3. Different types of tools, machines and accessories. 4. Practice Job (any two) a. Preparation of cross lap joints. b. T Lap joints c. Dovetail Joints d. Wood turning	02	08

02	<b>FITTING SHOP:</b> 1. Introduction 2. Various marking, measuring, cutting, holding and striking tools. 3. Different fitting operation like chipping, filing, right angle, marking, drilling, tapping etc. 4. Working Principle of Drilling machine, Tapping dies its use. 5. Safety precautions and safety equipments. 6. Practice any 2 Jobs (V groove, Square notch, Fitting of two parts )	02	08
03	<b>SHEET METAL SHOP.</b> 1. Introduction 2. Various types of tools, equipments and accessories. 3. Different types of operations in sheet metal shop. 4. Soldering and riveting. 5. Safety precautions 6. Practice Jobs (Making funnel, tray, cylinder)	02	08
04	<b>TURNING SHOP</b> 1. Introduction 2. Various marking, measuring, cutting, holding and striking tools. 3. Working Principle of Drilling machine, Tapping dies its use. 4. Drilling and Tapping 5. Turning: Plain, taper 6. Threading and Knurling 7. Safety precautions and safety equipments.	<b>02</b>	<b>08</b>
05	<b>ELECTRICAL &amp; ELECTRONICS</b> 1. Various types of electrical and electronic components and equipments. 2. Safety precautions 3. Preparation of different type of joints and switching systems 4. Wiring of two bulb, one fan one power point with a fuse connection. 5. Fault finding and repairing of common household appliances 6. Soldering and desoldering practice, Soldering of a pyramid 7. Soldering of a battery eliminator circuit/charger/PCB	02	10
06	<b>WELDING &amp; BLACK SMITHY SHOP</b> 1. Introduction to equipments and accessories used in welding 2. Gas, Arc, Spot, welding practice 3. Lap welding practice 4. Butt welding practice 5. Spot welding practice 6. Preparation of commonly used instruments such as flat chisel, ring, screw driver.	<b>02</b>	<b>10</b>



<b>07</b>	<b>PLUMBING SHOP</b> 1. Introduction. 2. Various marking, measuring, cutting, holding and striking tools. 3. Different types of G.I. & PVC pipes, flexible pipes used in practice. 4. Piping layout. 5. G.I. & PVC pipes fittings and accessories, Adhesive solvents- chemical action,	<b>02</b>	<b>08</b>
<b>Total</b>		<b>14</b>	<b>60</b>

**Skill to be developed:**

**Intellectual Skills:**

1. Ability to read job drawing
2. Ability to identify and select proper material, tools, equipments and machine.
3. Ability to select proper parameters (like cutting speed, feed, depth cut use of lubricants) in machine.

**Motor Skills:**

1. Ability to set tools, work piece, and machines for desired operations.
2. Ability to complete job as per job drawing in allotted time.
3. Ability to use safety equipment and follow safety procedures during operations.
  
4. Ability to inspect the job for confirming desired dimensions and shape.
5. Ability to acquire hands-on experience.

Notes: 1] The Faculty/Instructor shall give demonstration to the  
2] The workshop diary shall be maintained by each student duly signed by Faculty/Instructor of respective shop

**Books:**

- S.K. Hajara Chaudhary- Workshop Technology-Media Promoters and Publishers, New Delhi
- B.S. Raghuwanshi- Workshop Technology- Dhanpat Rai and sons, New Delhi
- R K Jain- Production Technology- Khanna Publishers, New Delhi
- H.S.Bawa- Workshop Technology- Tata McGraw Hill Publishers, New Delhi
- Kent's Mechanical Engineering Hand book- John Wiley and Sons, New York
- Electronics Trade & technology Development Corporation.(A Govt. of India undertaking) Akbar Hotel Annex, Chanakyapuri, New Delhi- 110 021
- Learning Materials Transparencies, CBT Packages developed by N.I.T.T.E.R. Bhopal.

**Course Name : 03 Years Diploma in Mining Engineering**

**Year : First**

**Subject Title : Professional Practice-I**

**Subject Code : M117**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External
TH			100	60	40	---	50	---

**Rationale:**

Most of the diploma holders are employed in industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion. These are planned in the semester so that there will be increased participation of students in learning process.

**Objectives:**

Student will be able to:

1. Acquire information from different sources.
2. Prepare notes for given topic.
3. Present given topic in a seminar.
4. Interact with peers to share thoughts.
5. Prepare a report on industrial visit, expert lecture.

Sr. No.	Activity
1	<p><b>Industrial Visits:</b></p> <p>Structured industrial visits be arranged and report of the same should be submitted by the individual student, to form part of the term work.</p> <p>Visits to any two of the following :</p> <ul style="list-style-type: none"> <li>i) Construction site for residential / Public building</li> <li>ii) Petrol Pump</li> <li>iii) Distribution Sub station</li> <li>iv) Small Scale industry.</li> <li>v) Appliances repair centre</li> <li>vi) Visit of mining site.</li> </ul>
2	<p><b>Lectures by Professional / Industrial Expert to be organized on any three topics of the following suggested areas or any other suitable topics:</b></p> <ul style="list-style-type: none"> <li>i) Pollution control.</li> <li>ii) Fire hazards due to short circuits</li> <li>iii) Fire Fighting / Safety Precautions and First aids.</li> <li>iv) Vedic Mathematics and Abacus.</li> <li>v) Topics related to Social Awareness such as –Traffic Control System, Career opportunities , Communication in Industry, Yoga Meditation, Aids awareness and health awareness</li> </ul>
3	<p><b>Group Discussion :</b></p> <p>The students should discuss in group of six to eight students and write a brief report on the same as part of term work. The topic for group discussions may be selected by the faculty members. Some of the suggested topics are -</p> <ul style="list-style-type: none"> <li>i) Sports</li> <li>ii) Cultural</li> <li>iii) Discipline and House Keeping</li> <li>iv) Current topic related to Electrical Engineering field.</li> </ul>

4	<p><b>Literature Survey</b> Student will be provided an emerging engineering topic for literature survey from Internet and other media. Based on inputs on the topics students will prepare a report and submit the sample for evaluation after due presentation before the faculty.</p>
5	<p><b>Presentation preparation and demonstration on live socio economics technical aspects.</b> Students in batch of maximum 5 numbers are expected to prepare a power point presentation on a topic with minimum of 20 slides. The topics can be from the following:</p> <ul style="list-style-type: none"><li>a. Rural vs urban divide</li><li>b. Resettlement and Rehabilitation</li><li>c. Land Reclamation</li><li>d. Make in India</li><li>e. Disorders in social setup</li><li>f. Satellite launching programs of India</li><li>g. Global Stake in Economics of India</li><li>h. Super power in making: India</li><li>i. Bottom of the pyramid</li><li>j. Social Responsibility of Individual</li><li>k. Swachh Bharat ABhiyan</li></ul>