

**1. COURSE TITLE : MATHEMATICS-I**

**2. COURSE CODE : TT-101**

**3. SEMESTER : 1<sup>ST</sup> ( First)**

**4. RATIONAL OF THE SUBJECT/ COURSE:** Mathematics make sense of information, experience, and ideas by engaging students to think:

- flexibly and creatively \* critically and effectively \*strategically and logically.

\* Accuracy

Mathematics will help students of Textile Technology at home, at work, at industry and in the community by problem-solving strategies, interpreting any type of data and communicating ideas.

Have a **broad background** in Mathematics, an appreciation of how its various sub-disciplines are related, the ability to use techniques from different areas, and an **in-depth knowledge** about topics chosen from those offered through the department.

**5. Course Outcomes:**

After completion of this course students will be able to-

- recognize the importance and value of mathematical training, and approach to problem solving, on a diverse variety of disciplines;
- be familiar with a variety of examples where mathematics helps accurately explain abstract or physical phenomena;
- recognize and appreciate the connections between theory and applications;
- be able to independently read mathematical literature of various types, including survey articles, scholarly books, and online sources; a
- Communicate and understand mathematical statements, ideas and results, both verbally and in writing, with the correct use of mathematical definitions, terminology and symbolism (Communication Skills).

- have a concept on natural number, complex number, imaginary number etc. Define Modulus of complex number, cube root of unity. Solve geometry by Application of complex number. To find roots of a Quadratic equation, compare relation between roots and coefficient, Type of nature of roots, to form quadratic equation from given root set.

- have a concept of volume and surface area of rectilinear figure and curvilinear figures, like Cylinder, Sphere, Cone, Prism, Pyramid.

- Have an idea about different form of straight lines, circle, Parabola & Ellipse. To Determine angle between two straight line, Condition for identical, perpendicular and parallel. Concept of tangent and normal. Problems related to circle, Parabola & Ellipse

**6. TEACHING SCHEME ( IN HOURS) : 55HOURS**

LECTURE	TUTORIAL	PRACTICAL	TOTAL
45	10	----	55

**7. EXAMINATION SCHEME**

Examination Full Marks	Theory			Practical				Total Marks
	Sessional Full Marks	Total Marks	Pass Marks	Examination		Sessional		
70	30	100	30	-	-	-	-	-

**8. DETAILED OF SYLLABUS**

C. NO	CHAPT TITLE	CONTENT	HOURS
<b>GROUP- A</b>			
1.	Complex number	1.1 Definition 1.2 Geometrical interpretation 1.3 conjugate complex number 1.4 Modulus , Amplitude 1.5 Polar form 1.6 Algebraic operation on complex number. 1.7 Cube root of unity 1.8 Solve Problem.	2hrs.
2.	Variation	2.1 Definition 2.2 Direct variation, indirect variation, Joint variation 2.3 Properties of variation. 2.4 Problem solve.	2hrs.
3.	Quadratic equation	3.1 Basic concept 3.2 Nature of roots 3.3 Relation between roots and co-efficient. 3.4 Formation of quadratic equation 3.5 Solve problem.	3hrs.
4.	Arithmetic and geometric progression.	4.1 Basic concept of A.P and G.P 4.2 nth term formulae for A.P and G.P 4.3 Sum to nth term of A.P and G.P . 4.4 Arithmetic mean and Geometric Mean 4.5 Solve problem .	3hrs.
5.	Logarithm	5.1 Definition of Logarithm 5.2 Laws of logarithm 5.3 change of base. 5.4 Some special cases. 5.5 Solve simple problem .	3hrs.
6.	Permutation and combination	6.1 Basic concept of Permutation and combination. 6.2 Factorial notation 6.3 Fundamental Principle 6.5 Meaning of ${}^n P_r$ and ${}^n C_r$ . 6.6 Theorem related to Combination. 6.7 Solve simple problem.	3hrs
7.	Determinant.	7.1 Formation of determinant. 7.2 Laplace's Expansion of determinant of second and 3 <sup>rd</sup> order.	4hrs.

		7.3 Properties of Determinant 7.4 Solve simultaneous equations in three variables using Cramer's rule. 7.5 Problem involving Properties of determinant .	
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Group-B			
1.	Revision of Trigonometric ratios of acute angles	1.1 Trigonometric functions. 1.2 Height and distance 1.3 Solve examples	1hrs.
2.	Trigonometric ratios of Associated Angles	2.1 ASTC Rule 2.2 $\sin(-\theta)$ ; $\cos(-\theta)$ ; $\sin(90^\circ+\theta)$ ; $\cos(90^\circ+\theta)$ ; $\sin(90^\circ-\theta)$ ; $\cos(90^\circ-\theta)$ ; $\sin(180^\circ+\theta)$ ; $\cos(180^\circ+\theta)$ ; $\sin(180^\circ-\theta)$ ; $\cos(180^\circ-\theta)$ 2.3 Some results. 2.4 Solve Examples	2hrs.
3.	Compound Angle	3.1 compound angle for addition formula 3.2 compound angle for addition formula 3.3 Solved Examples	2hrs.
4.	Transformation of sums and products.	4.1 Expression of sum and difference as product. 4.2 Solve Examples	2hrs.
5.	Multiple and sub multiple Angle.	5.1 $\sin 2A$ ; $\cos 2A$ ; $\sin 3A$ ; $\cos 3A$ .... 5.2 Related problem	2hrs.
6.	Trigonometric Identities	6.1 Basic concept 6.2 Related Problems	2hrs.

**GROUP - C**

C. NO	CHAPT. NAME	CONTENT	HOURS
1.	Mensuration	1.1 Area of two dim. Figure. 1.2 Area of a regular Polygon of n side 1.3 Recti lineal figures and curvilineal figures. 1.4 Volume and surface areas of Prism, Cylinder Sphere; Cone ; Pyramid.	1 1 2 4

<b>GROUP –D</b>			
1.	Straight Line	1.1 Gradient Form, Intercept form, Perpendicular Form etc. 1.2 Distance of a line from a point 1.3 Angle between two point 1.4 Condition for Perpendicularity and Parallelism. 1.4 Condition for identical. 1.5 Related Problem	2hrs.
2.	Circle	2.1 General Equation of circle 2.2 Equation of circle through three given points. 2.3 Equation to the circle with given diameter. 2.4 Tangent and normal.	2hrs.
3.	Conic Section: Parabola Ellipse	3.1 Different forms of equation of Parabola and their components. 3.2 Different forms of equation of ellipse and their components.	2hrs.

**9. DISTRIBUTION OF MARKS:**

C.N	CHAPTER NAME	TYPE OF QUESTION			TOTAL MARKS
		Objective Type	Short Question	Descriptive Type	
<b>GROUP-A</b>					
1.	Complex number	1	$1\frac{1}{2}$		$2\frac{1}{2}$
2.	Variation	1	$1\frac{1}{2}$		$2\frac{1}{2}$
3.	Quadratic equation	1		3	4
4.	Arithmetic and geometric progression.	1		3	4
5.	Logarithm	1	2	3	6
6.	Permutation and combination	1		3	4
7.	Determinant	1		3	4
<b>GROUP-B</b>					
1.	Revision of Trigonometric ratios of acute angles	1	2		3
2.	Trigonometric ratios of Associated Angles	1	2		3
3.	Compound Angle	1	2		3
4.	Transformation of sums and products.	1	2		3
5.	Multiple and sub multiple Angle.	1	2		3
6.	Trigonometric Identities			4	4
<b>GROUP-C</b>					

1.	Mensuration			4+4=8	8
<b>GROUP-D</b>					
1.	Straight Line.	1		3+3=6	7
3.	Conic Section	1		4	5
Total =		15	15	40	70

**TABLE OF SPECIFICATIONS FOR THEORY**

Sr. No	Topic (a)	Time allotted in hours (b)	Percentage Weightage (c)	K	C	A	H A
1.	Complex number	2 hours	4.4	1		1.5	
2.	variation	2 hours	4.4	1		1-5	
3.	Quadratic equation	3 hours	6.7	1		3	
4.	Arithmetic and Geometric progression	3 hours	6.7	1		3	
5.	Logarithm	3 hours	6.7	1		3	2
6.	Permutation and combination	3 hours	6.7	1		3	
7.	Determinant	4 hours	8.9	1		3	
8.	Revision of Trigonometric ratios of acute angles	2 hours	4.4	1		2	
9.	Trigonometric ratios of associated angles	2 hours	4.4	1		2	
10.	Compound angles	2 hours	4.4	1		2	
11.	Transformation of sums and Products	2 hours	4.4	1		2	
12.	Multiple and submultiple angle	2 hours	4.4	1		2	
13.	Trigonometric identities	2 hours	4.4			4	
14.	Mensuration	8 hours	17.7	1		4	3
15.	Straight Line	2 hours	4.4	1		3+	
						3	
16.	Circle	2 hours	6.7	1		3	
17.	Conic Section Parabola Ellipse	2 hours	8.9	1		4	
<b>Total</b>		$\Sigma b=45$	100				

K =Knowledge      C =Comprehension ;A =Application;      HA = Higher Than Application (Analysis, Synthesis, Evaluation)  $c = \frac{b}{\sum b} \times 100$

**DETAILED TABLE OF SPECIFICATIONS FOR THEORY**

S N	Topic	OBJECTIVE TYPE				SHORT ANSWER TYPE					ESSAY TYPE				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Comp. number	1			1			1.5		1.5					
2	Variation		1		1			1.5		1.5					
3	Quadratic eqn.	1			1							3		3	
4	A.P and G.P		1		1							3		3	
5	Logarithm			1	1			2		2		3		3	
6	Perm.& comb.	1			1				3	3					
7	Determinant	1			1							3		3	
1	Rev.of Trig ratios of acute ang			1	1			2		2					
2	Trig. ratios of asso. angles			1	1			2		2					
3	Compound angles	1			1			2		2					
4	Trans. of sums & products	1			1			2		2					
5	Mult. &submult. angle	1			1			2		2					
6	Trig. identities											4		4	
1	Mensuration	1			1							4	3	7	
1	Straight Line	1			1							3	3	6	
2	Circle	1			1							3		3	
3	Conic Section Parabola Ellipse	1			1							4		4	

K =Knowledge C =Comprehension A = Application HA = Higher Than Application T = Total

10. Suggested Implementation Strategies: Students should be provided with opportunities, encouragement, and assistance to engage in thinking, reasoning, and sense making in the mathematics classroom. The course have to be completed within regular classes, Three sessional exams and 7 Tutorial classes are included in the Syllabus. In Tutorial classes consistent engagement in practices of mathematics may lead to a deeper understanding of mathematics, as well as the ability to demonstrate complex problem solving, reasoning, and communication skills on assessment of learning outcomes. This will enhance classroom discussions, which would build students' capacity for mathematical thinking and reasoning. Study material can also be provided to them.

10.1 Book List :

1. Mathematics for Polytechnics by S.P Deshpande.2.Engineering Mathematics by H.K Das3. Polytechnic Mathematics-1 Published by MoniManik

10.2 List of Journals:

10.3 Manuals: Mathematical Dictionary/ encyclopaedia as a hand book. Mathematical model.

10.4 Others: model question Paper/ question bank can be discussed with Help of internet

1. **Course title** : CHEMISTRY-1

2. **Course code** : TT-102

3. **Semester** : First semester

4. **Rationale of the course** : Modern development of textile industries require more understanding of substances used for Industrial purposes. This part of the chemistry explains various fundamentals underlying the chemistry of substances, which will develop basic understanding and skill of the students

5. **Course Outcomes** : After completion of the course student will be able to:

- i. Apply concept of mole in various stoichiometric calculation, Acids and bases.
- ii. Correlate chemical bonding with the properties of various compound.
- iii. Determine strength of acids and bases by titration using indicator.
- iv. Calculate pH of solution, prepare and use buffer solution to obtain high yield of industrially important products.
- v. Use electronic concept of oxidation and reduction in various chemical reactions.
- vi. Propose nomenclature of organic compounds, describe preparation, properties and Isomerism of organic compounds, plastic and polymer.

6. Teaching scheme (per week)

L	T	P	Credit point
3	1	4	5

7. Teaching scheme (in hours)

Lecture	Tutorial	Practical	Total
45 (including 3 class test)	8	30	83

8. Examination Scheme

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
70	30	100	30	-	-	-	-

9. Detailed Course Content :

Chapter No	Chapter Title	Content	Hours
Unit-I	Molecular Mass	1.1 Concept of Molecule, Molecular formula, Molecular mass, Mole-Definition-Simple calculations. 1.2 Avogadro's hypothesis, Relationship between Molecular Mass and vapour density Avogadro's number- Simple problem 1.3 Equivalent mass Equivalent Mass and gram equivalent mass of acids, bases and salts.	8

Unit-II	Acids and bases	2.0 Acid and Bases 2.1 -Definition, theories of acids and bases, 2.2 Definition of P <sup>H</sup> & P <sup>OH</sup> . Numerical problem, 2.3 Buffer solutions- Definition, type and example- Buffer action . Application.	8
Unit-III	Chemical bonding	3.1 Definition – Ionic bonding- Covalent bonding, Coordinate bonding, Metallic bonding, Hydrogen bonding.	5
Unit-IV	Oxidation-Reduction	4.1 Definition, Electronic Concept of oxidation and reduction- Example.	2
Unit-V	Solution	5.1 Definition, Methods of expressing concentration of a solution, Molarity, Molality, Normality, Percentage, grams per liter. Simple problem. 5.2 Standard solution, Normal solution, Titration, Indicators,	8
Unit-VI	Organic chemistry	6.1 Alkane, Alkene, Alkyne, Cyclic compounds, Aldehydes, Organic acids, Nomenclature, 6.2 Isomerism.	10
Unit-VII	Plastics and Polymers	7.1 Definition, types of polymerizations, classification of polymers. 7.2 Some important plastic materials-their properties and uses-namely- Polythene, Bakelite, PVC, Polystyrene, nylon, PVA etc.	4

10. Distribution of Marks :

Chapter No	Chapter Title	Type of Question			Total Marks
		Objective Type	Sort Questions	Descriptive Questions	
Unit I	Molecular mass	1+1	2+2	6	14
Unit I	Acid and Bases	1	2	6+5	14
Unit III	Chemical bonding	1		5	6
Unit IV	Oxidation-Reduction	1	3		4
Unit V	Solution	1+1	4	6	10
Unit VI	Organic Chemistry	1+1	2	6+6	16
Unit VII	Plastic and Polymers	1		5	6
		10	15	45	70



**11. TABLE OF SPECIFICATIONS FOR THEORY**

S N	Topic (a)	Time allotted in hours (b)	Percentage Weightage (c)	K	C	A	HA
1	Molecular mass	8	18	3	8	3	
2	Acids and Bases	8	18	4	4	4	2
3	Chemical bonding	5	11	1	3	2	
4	Oxidation-Reduction	2	4	1	3		
5	Solution	8	18	2	5	3	
6	Organic Chemistry	10	22	1	6	5	4
7	Plastics and Polymer	4	9	1	5		
<b>Total</b>		Σ b	100				

K = Knowledge                      C = Comprehension                      A = Application  
 HA= Higher Than Application (Analysis, Synthesis, Evaluation)

**12. DETAILED TABLE OF SPECIFICATIONS FOR THEORY**

Sr N	Topic	OBJECTIVE TYPE				SHORT ANSWER TYPE					ESSAY TYPE				
		K	C	A	T	K	C	A	H A	T	K	C	A	H A	T
1	Molecular mass	1	1		2		2			2	2	5	3		10
2	Acids and Bases	1	1	1	3	1				1	2	3	3	2	10
3	Chemical bonding	1	1		2		2	2		4					
4	Oxidation-Reduction	1			1		3			3					
5	Solution	1	1		2		2			2	1	2	3		6
6	Organic Chemistry	1	1	1	3		3			3		2	4	4	10
7	Plastics and Polymer	1	1		2							4			4

K = Knowledge                      C = Comprehension                      A = Application                      HA  
 = Higher Than Application                      T = Total

13. Suggested Implementation Strategies : The syllabus can be completed by regular classes, special classes using audio –visual aids, tutorial classes and providing writing materials. Practical classes in the laboratory helps students to understand the subject.

14. Suggested learning Resource :

1. Chemistry for Polytechnic, Vol-I, by Jyotishmoy Bora, RajuOjah.
2. Simplified Polytechnic Chemistry Vol-I, by VinayYadav.
3. Modern Approach to Chemistry, Part I and Part –II, Y. R. Sharma, BaidyaNathBhyan, SudarsonBarua. Part I and Part-II.
4. Senior Secondary Chemistry- Part I and Part II by KamaleshChoudhury, Satyendra Kumar Choudhury.
5. Engineering Chemistry- by Jain& Jain, DhanpatRai Publishing Co.
6. A text book of Engineering Chemistry- by S. S. Dara, S. Chand & Company Ltd.

S.N	Course outcome	Intended Learning Outcome
1.	Describe Molecule, Molecular mass, Mole, Equivalent mass, Avogadro's Hypothesis.	<ol style="list-style-type: none"> <li>a. Define Molecule and molecular mass.</li> <li>b. Explain Mole.</li> <li>c. Utilise the concept of mole in simple calculation.</li> <li>d. Describe Avogadro's hypothesis.</li> <li>e. Explain relationship between Molecular Mass and vapour density</li> <li>f. Utilise Avogadro's hypothesis for solving simple problem.</li> <li>g. Define equivalent weight of Acids, Bases and Salts.</li> <li>h. Calculate equivalent weight of Acids, Bases and Salts.</li> </ol>
2.	Explain Acid, Bases and Salts, Arrhenius, Bronsted-Lowry and Lewis theory, pH, pOH and Buffer solution	<ol style="list-style-type: none"> <li>a. Define Acids, Bases and Salts.</li> <li>b. Give examples of different classes of Acids, Bases and Salts.</li> <li>c. Explain Arrhenius theory.</li> <li>d. Explain Bronsted-Lowry concept.</li> <li>e. Explain Lewis theory.</li> <li>f. Define pH and pOH</li> <li>g. Determine pH of a solution.</li> <li>h. Explain Buffer solution.</li> </ol>
3.	Describe Ionic bonding, Covalent bonding and Co-ordinate bonding, Metallic bonding, Hydrogen bonding.	<ol style="list-style-type: none"> <li>a. Define Electrovalent or Ionic bond, Covalent bond and co-ordinate covalent bond.</li> <li>b. Differentiate between Electrovalent, covalent and co-ordinate covalent compounds.</li> <li>c. Explain characteristics of Ionic compound.</li> <li>d. Explain characteristics of covalent compound.</li> <li>e. Describe Hydrogen bonding and Metallic bonding</li> </ol>
4.	Explain Electronic concept of oxidation and reduction.	<ol style="list-style-type: none"> <li>a. Define Oxidation and Reduction.</li> <li>b. Describe Electronic concept of oxidation.</li> <li>c. Describe Electronic concept of Reduction.</li> <li>d. Give examples of oxidation and Reduction.</li> <li>e. Describe oxidising agent and reducing agent.</li> </ol>

5.	Describe Standard solution, Normal solution, Normality, Molarity, Molality and acid – base titration	<ul style="list-style-type: none"> <li>a. Explain normal solution, molar solution and standard solution.</li> <li>b. Define normality, molarity and molality.</li> <li>c. Explain principle of titration.</li> <li>d. Determine the unknown strength of acids and bases</li> </ul>
b.	Describe Organic compounds its classification, nomenclature, Alkane, alkene, alkyne, Cyclic compound, Aldehydes, Organic acids and Isomerism.	<ul style="list-style-type: none"> <li>a. Describe classification of organic compound.</li> <li>b. Define Homologous series.</li> <li>c. Define Functional group.</li> <li>d. Give examples of functional group.</li> <li>e. Use IUPAC rules for naming organic compounds.</li> <li>f. Define Isomerism.</li> <li>g. Draw the isomers of different alkane.</li> <li>h. Explain classification of Isomerism.</li> <li>i. Describe preparation and properties of Alkanes, Alkenes, Alkynes, Aldehyde and organic acid.</li> </ul>
c.	Discuss Plastics, Polymer and Polymerization.	<ul style="list-style-type: none"> <li>a. Define Polymer.</li> <li>b. Describe classification of polymer.</li> <li>c. Define polymerisation</li> <li>d. Explain types of polymerisation.</li> <li>e. explain formation and properties of Polythene, Bakelite, PVC, Polystyrene, nylon etc</li> </ul>

**1 Course Title : CHEMISTRY –I PRACTICAL**

**2 Course Code : TT – 102(P)**

**3 Semester : First semester**

**4 Objectives :** At the end of the program the student will be able to prepare standard solutions and can determine the strength of acids and bases.

**5. Teaching and Examination Scheme :**

Instructions	
Hours/week	Hours/Semester
2	30

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
-	-	-	-	25	25	50	15

**6. Detailed Course Content :**

**Content Hours**

- |   |    |
|---|----|
| 1. Fitting up Simple Apparatus.   | 4  |
| 2. Preparation of Standard solution of Na <sub>2</sub> CO <sub>3</sub> .            | 10 |
| 3. Titration -Determination of strength of acids and bases by volumetric titration. | 16 |

**7. Books :**

1. Elementary Practical Chemistry ,by G.D. Sharma and Arun Baht.
2. Elements of Practical Chemistry ,by SudarsonBarua

1. **Course Title** : **PHYSICS-I**
2. **Course code** : **TT-103**
3. **Semester** : **1<sup>st</sup> (First)**
4. **Rationale** : This part of the course explains the basic fundamentals of Physics which will develop basic understanding of the students.
5. **Course Outcome:** After completion of this course students will be able to-
  - Know about the basic mechanics of any body
  - Understand different energies, such as heat energy, its effect etc.
  - Know to measure heat and temperature of any body
  - Know the properties of solid, liquid and gasses.
  - Understand the sound energy, its property and to calculate the speed of sound in air or any other medium.
  - Know the difference between sound and noise

**6. Teaching Scheme ( in per week) :**

Lecture L	Tutorial T	Practical P	Credit point
3	1	4	5

**7. Teaching Scheme ( in hours) :**

Lecture	Tutorial T	Practical P	Total
42	3	10	55

**8. Examination Scheme :**

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
70	30	100	30	25	25	50	15

**9. Detailed Course Content:**

Chap No.	Chapter Title	Content	In hours
1	UNIT AND DIMENSION	<b>1.1</b> Unit, fundamental and derived units, measurements, system of measurements, CGS, MKS, FPS and SI with their units	1hr
		<b>1.2</b> Dimension of Physical Quantity and dimensional equation of physical quantities with examples.	1hr
2	BASIC MECHANICS	<b>2.1</b> Scalar and Vector quantity, representation of a vector, vector addition and subtraction, Parallelogram method of vector addition, resolution of vectors, numerical problems.	2hrs
		<b>2.2</b> Explanation of speed and velocity, acceleration and retardation, Equation of motion, (Deduction of	2hrs

		<p>equation of motion is not required), Numerical problems on equation of motion.</p> <p><b>2.3</b> Newton's laws of motion, Statement and explanations of First, second and third Newton's laws of motion, Definition and unit of force.</p> <p><b>2.4</b> Circular motion, angular velocity, relationship between angular velocity and linear velocity, centripetal force and centrifugal force, Simple pendulum, numerical problems.</p> <p><b>2.5</b> Friction, static friction and limiting friction, laws of limiting friction, co-efficient of friction, method of removal of friction, numerical problems.</p> <p><b>2.6</b> Simple machine, principle of work, mechanical advantage, velocity ratio, efficiency and their relationship, lever, classes of lever.</p>	<p>2hrs</p> <p>2hrs</p> <p>2hrs</p> <p>2hrs</p>
3	GRAVITY AND GRAVITATION	<b>3.1</b> Newton's laws of gravitation, center of gravity, centre of mass, couple and moment of force, mass and weight of a body, their differences.	2hrs
4	WORK, POWER AND ENERGY	<b>4.1</b> Work, power and energy, Explanation, mathematical expression and dimensions, potential and kinetic energy, their mathematical expressions, Principle of conservation of energy and its proof in case of a freely falling body.	2hrs
5	PROPERTIES OF SOLID	<b>5.1</b> Elasticity, its definition and explanation, explanation of types of strain produced on a body, elastic limit, Hook's law, Explanation of Young's modulus, Bulk or volume rigidity modulus of elasticity, numerical problems.	2hrs
6	PROPERTIES OF LIQUID	<p><b>6.1</b> Thrust and pressure of liquid, expression of pressure at a point inside a liquid, Laws of liquid pressure, Pascal's law of transmission of liquid, unit of pressure- Pascal.</p> <p><b>6.2</b> Buoyancy, Archimedes principle, Density and relative density or specific gravity of a substance.</p> <p><b>6.3</b> Surface tension, explanation, angle of contact, capillarity</p> <p><b>6.4</b> Viscosity, its explanation and mathematical expression, co-efficient of viscosity, poise, numerical problems.</p>	<p>2hrs</p> <p>1hr</p> <p>1hr</p> <p>1hr</p>
7	PROPERTIES OF GAS	<b>7.1</b> Atmospheric pressure, Torricelli's experiment, expression of atmospheric pressure, Barometer, humidity, moisture in the atmosphere, relative humidity, importance of humidity in textile	1hrs

		technology. 7.2 Kinetic theory of gas, postulates of Kinetic theory of gas.	1hr
8	HEAT & THERMODYNAMICS	8.1 Concept of heat and temperature, measurement of temperature, different scale of temperature and their relationship thermometer, numerical problems. 8.2 Unit of heat, Calorie, Kilo-Calorie Joule, CHU, 8.3 Measurement of heat, Principle of calorimetry, Specific heat, thermal capacity and water equivalent with their mathematical expression and units. 8.4 Thermal expansion of solid, linear, cubical and volume expansion of solid and their coefficients of expansions. 8.5 Change of state of matter, cycle of change of matter, explanation of Fusion, boiling, melting and boiling point of matter, Evaporation. 8.6 Transmission of heat, three processes of transmission, conduction, convection and radiation.	2hrs 1hr 1hr 2hrs 1hrs 1 hr
9	SOUND	9.1 Wave and wave motion, Transverse and longitudinal wave and their differences, representation of wave, Definition of wave length, frequency amplitude, time period of vibration and their relationship. 9.2 Sound wave, propagation of sound wave, audible range of sound, infrasonic and ultrasonic sound. 9.3 Reflection of sound, persistence of hearing, Explanation of echo and reverberation, Acoustic of building. 9.4 Speed of sound in a medium, Newton's formula of velocity of sound, Laplace correction effects of pressure, temperature and density of medium on velocity of sound. 9.5 Musical sound and noise, their differences, explanation of Doppler effect (mathematical expression not required)	2hrs 1hr 2hr 1hr 1hr

**10. Distribution of Marks:**

Chap No.	Chapter Title	Type of Question			Total Marks
		Objective type Compulsory	Short Question	Descriptive Question	
1	UNITS AND DIMENSIONS	1	2	2	5
2	BASIC MECHANICS	1	2	13	16
3	GRAVITATION AND GRAVITY	1	1	3	5
4	WORK, POWER AND ENERGY	2	2	4	8

5	PROPERTIES OF SOLID	1	2	5	8
6	PROPERTIES OF LIQUID	1	2	2	5
7	PROPERTIES OF GAS	1	2	2	5
8	HEAT & THERMODYNAMICS	1	1	8	10
9	WAVE AND SOUND	1	1	6	8
TOTAL=		10	15	45	70

**11. DETAILED TABLE OF SPECIFICATIONS FOR THEORY:**

S N	Topic	OBJECTIVE TYPE				SHORT ANSWER TYPE					ESSAY TYPE				
		K	C	A	T	K	C	A	H A	T	K	C	A	H A	T
1	UNITS AND DIMENSIONS	$\frac{1}{2}$		$\frac{1}{2}$	1	1		1		2	1		1		2
2	BASIC MECHANICS	$\frac{1}{2}$		$\frac{1}{2}$	1	1	1			2	4	4	5		1 3
3	GRAVITATION AND GRAVITY	1			1	$\frac{1}{2}$	$\frac{1}{2}$			1	1	1	1		3
4	WORK, POWER AND ENERGY	1		1	2	1	1			2	1	1	1		4
5	PROPERTIES OF SOLID	1			1		1	1		2	1	2	2		5
6	PROPERTIES OF LIQUID	1			1		1	1		2	1		1		2
7	PROPERTIES OF GAS	1			1		1	1		2	1		1		2
8	HEAT & THERMODYNAMICS	1			1		1			1	3	3	2		8
9	WAVE AND SOUND	1			1		1			1	2	2	2		6

K=Knowledge, C= Comprehension, A= Application, HA= Higher than application (analysis, synthesis, Evaluation) and T=Total

**12. TABLE OF SPECIFICATIONS FOR THEORY**

Sr. No:	Topics (a)	Time allotted in hours (b)	Percentage Weightage (c)	K	C	A	HA
1	UNITS AND DIMENSIONS	2	4.7	$2\frac{1}{2}$	-	$2\frac{1}{2}$	



2	BASIC MECHANICS	12	28.5	$5\frac{1}{2}$	5	$\frac{1}{2}$	
3	GRAVITATION AND GRAVITY	2	4.7	$2\frac{1}{2}$	$1\frac{1}{2}$	1	
4	WORK, POWER AND ENERGY	2	4.7	3	2	2	
5	PROPERTIES OF SOLID	2	4.7	2	3	3	
6	PROPERTIES OF LIQUID	5	11.9	2	1	2	
7	PROPERTIES OF GAS	2	4.7	2	1	2	
8	HEAT & THERMODYNAMICS	8	19	4	4	2	
9	WAVE AND SOUND	7	16.6	3	3	2	
TOTAL		42					
		$\Sigma b$	100%				

K=Knowledge, C= Comprehension, A= Application, HA= Higher than application ( analysis, synthesis, Evaluation)

$$C = \frac{b}{\Sigma b} \times 100$$

### 13. Suggested Implementation Strategies:

The syllabus can be completed by regular classes, special classes using audio –visual aids, tutorial classes and providing writing materials. Practical classes in the laboratory helps students to understand the subject.

14. **Suggested learning Resource:** By using Models, Vedio, PPT etc.

15.1 Book list: 1. Principle of Physics by- N Subramanium and BrijLal,

2. A Text book on Applied Physics-I by DwijendraSarma.

3. Modern Approach to Physics Vol-I Chakraborty& Sharma

4. Polytechnic Physics by Dr. B Baishya.

15.2 list of journals:

13.3 Manuals: Course materials, handouts etc.

14.4 Others:

S.N	Course outcome	Intended Learning Outcome
1.	<b>1.0UNIT AND MEASUREMENTS:</b> <b>1.1</b> Unit, fundamental and derived units, measurements, system of measurements, CGS, MKS, FPS and SI with their units.1hr ➤ Explanation of Physical Quantity, fundamental and derived ➤ System of measurement ➤ Explanation of unit, type of unit, fundamental and derived unit ➤ CGS, MKS, FPS and SI with their units.	1. Explain Physical Quantity, fundamental and derived quantity with examples 2. Know what measurements mean 3. Know the different systems of measurements 4. Explain unit of physical quantity, 5. Classify the unit, fundamental and derived unit 6. Know CGS, MKS, FPS and SI with their units.
	<b>1.2</b> Dimension of Physical Quantity and dimensional equation of	1. Define and explain the dimension of physical quantity

	<p>physical quantities with examples. <b>1hr</b></p> <ul style="list-style-type: none"> <li>➤ Definition and explanation of dimension of physical quantity</li> <li>➤ Dimensional equation of physical quantity with example.</li> </ul>	<ol style="list-style-type: none"> <li>2. What is dimensional equitation</li> <li>3. Write the Dimensional equation of physical quantity</li> <li>4. Apply dimension to derive physical equation</li> <li>5. Apply dimension to see the correctness of a physical equation</li> </ol>
	<p><b>2.0BASIC MECHANICS:</b> <b>2.1</b> Scalar and Vector quantity, Representation of a vector, vector addition and subtraction, Parallelogram method of vector addition. <b>2hrs</b></p> <p>Introduction to scalar and vector quantity, their definition and explanation</p> <ul style="list-style-type: none"> <li>➤ Difference between scalar and vector quantity</li> <li>➤ Representation of vector quantity, vector</li> <li>➤ Vector addition, parallelogram method of vector addition, subtraction</li> <li>➤ applications</li> </ul>	<ol style="list-style-type: none"> <li>1. Define and explain scalar quantity</li> <li>2. Define and explain vector quantity,</li> <li>3. Understand the difference between scalar and vector quantity</li> <li>4. Represent of vector quantity, vector</li> <li>5. Add Vectors ,</li> <li>6. Understand the parallelogram method of vector addition, subtraction etc.</li> <li>7. Apply parallelogram method to add vectors</li> <li>8. To resolve vectors</li> </ol>
2	<p><b>2.2</b> Explanation of speed and velocity, acceleration and retardation, Equation of motion, (Deduction of equation of motion is not required), Numerical problems on equation of motion.<b>2hrs</b></p> <ul style="list-style-type: none"> <li>➤ concept of rest and motion of a body</li> <li>➤ definition and explanation of speed and velocity, acceleration and retardation, their mathematical expressions</li> <li>➤ equation of uniformly accelerated motion</li> <li>➤ solution of numerical problems</li> </ul>	<ol style="list-style-type: none"> <li>1. Understand the concept of rest and motion of a body</li> <li>2. define and explain of speed and velocity, acceleration and retardation, their mathematical expressions</li> <li>3. write the equation of uniformly accelerated motion</li> <li>4. solve the numerical problems</li> </ol>
	<p><b>2.3</b> Newton's laws of motion, Statement and explanations of First, second and third Newton's laws of motion, Definition and unit of force. <b>2hrs</b></p> <ul style="list-style-type: none"> <li>➤ concept of inertia, inertia of rest</li> </ul>	<ol style="list-style-type: none"> <li>1. understand the concept of inertia,</li> <li>2. define and explain the inertia of rest and motion</li> <li>3. state and explain of Newton's 1<sup>st</sup> laws of motion</li> <li>4. define of force and mass of a body</li> <li>5. concept of momentum, its expression and</li> </ol>

<p>and motion</p> <ul style="list-style-type: none"> <li>➤ statement and explanation of Newton's 1<sup>st</sup> laws of motion</li> <li>➤ definition of force and mass of a body</li> <li>➤ concept of momentum, its expression and unit with dimension</li> <li>➤ statement, explanation and deduction of Newton's 2<sup>nd</sup> laws of motion</li> <li>➤ explanation of impulse with its unit</li> <li>➤ concept and explanation of action and reaction</li> <li>➤ statement and explanation of Newton's 3<sup>rd</sup> laws of motion</li> <li>➤ solution of numerical problems.</li> </ul>	<p>unit with dimension</p> <ol style="list-style-type: none"> <li>6. statement, explanation and deduction of Newton's 2<sup>nd</sup> laws of motion</li> <li>7. explain the impulse with its unit</li> <li>8. deduce the relation between force, acceleration and mass of a body</li> <li>9. concept and explain the term action and reaction</li> <li>10. state and explain of Newton's 3<sup>rd</sup> laws of motion</li> <li>11. solve of numerical problems.</li> </ol>
<p><b>2.4</b> Circular motion, angular velocity, relationship between angular velocity and linear velocity, centripetal force and centrifugal force, Simple pendulum, numerical problems. <b>2hrs</b></p> <ul style="list-style-type: none"> <li>➤ definition and explanation of circular motion with example</li> <li>➤ explanation of angular velocity and angular displacement</li> <li>➤ relationship between linear velocity and angular velocity of a body</li> <li>➤ explanation of centripetal force with mathematical expression</li> <li>➤ explanation of centrifugal force with mathematical expression</li> <li>➤ explanation of simple pendulum, its time period</li> <li>➤ solution of numerical problems</li> </ul>	<ol style="list-style-type: none"> <li>1. define and explain circular motion with examples</li> <li>2. explanation of angular velocity and angular displacement</li> <li>3. know the relationship between linear velocity and angular velocity of a body</li> <li>4. know the unit of angular velocity</li> <li>5. explain centripetal force with mathematical expression</li> <li>6. explain centrifugal force with mathematical expression</li> <li>7. explain simple pendulum, its time period</li> <li>8. solve numerical problems</li> </ol>
<p><b>2.5</b> Friction, static friction and limiting friction, laws of limiting friction, co-efficient of friction, method of removal of friction, numerical problems. <b>2hrs</b></p> <ul style="list-style-type: none"> <li>➤ explanation of friction- type of friction, friction and limiting friction</li> <li>➤ laws of limiting friction, co-efficient of friction</li> <li>➤ methods of removal of friction,</li> <li>➤ solution of numerical problems.</li> </ul>	<ol style="list-style-type: none"> <li>1. explain the friction-</li> <li>2. classify friction, friction and limiting friction</li> <li>3. know laws the of limiting friction,</li> <li>4. know the co-efficient of friction</li> <li>5. know the method of removal of friction,</li> <li>6. solve of numerical problems.</li> </ol>
<p><b>2.6</b> Simple machine, principle of</p>	

	<p>work, mechanical advantage, velocity ratio, Efficiency and their relationship, lever, classes of lever. <b>1hr</b></p> <ul style="list-style-type: none"> <li>➤ definition of simple machine with example</li> <li>➤ principle of work</li> <li>➤ lever, types of lever, principle of lever</li> <li>➤ explanation of mechanical advantage, velocity ratio, efficiency and their relationship,</li> </ul>	<ol style="list-style-type: none"> <li>1. Define and explain simple machine with example</li> <li>2. know the principle of work</li> <li>3. define and explain lever,</li> <li>4. classify lever, class-I, class-II and class-III</li> <li>5. know the principle of lever</li> <li>6. explanation of mechanical advantage, velocity ratio, efficiency</li> <li>7. deduce their relationship,</li> </ol>
3	<p><b>3.0 GRAVITY AND GRAVITATION</b></p> <p><b>3.1</b> Newton's laws of gravitation, centre of gravity, centre of mass, couple and moment of force. mass and weight of a body, their differences. <b>2hrs</b></p> <ul style="list-style-type: none"> <li>➤ explanation of gravitation and gravity</li> <li>➤ difference between gravity and gravitation</li> <li>➤ statement and mathematical expression of Newton's law of gravitation</li> <li>➤ dimension of g and G with their unit</li> <li>➤ explanation of centre of mass and gravity</li> <li>➤ couple and moment of force.</li> <li>➤ mass and weight of a body, their differences.</li> </ul>	<ol style="list-style-type: none"> <li>1. explain and define gravitation and gravity</li> <li>2. know the difference between gravity and gravitation</li> <li>3. state and deduce the mathematical expression of Newton's law of gravitation</li> <li>4. know the dimension of g and G with their unit</li> <li>5. explain centre of mass and centre gravity</li> <li>6. explain couple and moment of force.</li> <li>7. Know mass and weight of a body,</li> <li>8. Know the differences between mass and weight of a body</li> </ol>
4.	<p><b>4.0 WORK, POWER AND ENERGY:</b></p> <p><b>4.1</b> Work, power and energy, Explanation, mathematical expression and dimensions, potential and kinetic energy, Principle of conservation of energy and its proof, <b>2hrs</b></p> <ul style="list-style-type: none"> <li>➤ definition and explanation of work, mathematical expression with their unit</li> <li>➤ definition and explanation of power, mathematical expression with their unit</li> </ul>	<ol style="list-style-type: none"> <li>1. Know the definition and explanation of work, mathematical expression with their unit</li> <li>2. define and explanation of power,</li> <li>3. know the mathematical expression of power with their unit</li> <li>4. define and explain energy,</li> <li>5. know the mathematical expression of energy with their unit</li> <li>6. explain of P.E and their mathematical expression with unit</li> <li>7. know the explanation of K.E,</li> <li>8. know deduction of expression of K.E</li> <li>9. know the Principle of conservation of</li> </ol>

	<ul style="list-style-type: none"> <li>➤ definition and explanation of energy, mathematical expression with their unit</li> <li>➤ explanation of P.E, their expression with unit</li> <li>➤ explanation of K.E, deduction of expression of K.E</li> <li>➤ Principle of conservation of energy and its proof,</li> </ul>	<p>energy and its proof,</p>
<p>5.</p>	<p><b>5.0 PROPERTIES OF SOLID:</b>  Elasticity, its definition and explanation, explanation of stress, strain, types of strain produced on a body, elastic limit, Hook's law, Explanation of Young's modulus, Bulk or volume modulus and rigidity modulus of elasticity, numerical problems. <b>2hrs</b></p> <ul style="list-style-type: none"> <li>➤ Explanation of elasticity</li> <li>➤ Explanation of stress, strain</li> <li>➤ Different types of strains produced</li> <li>➤ Elastic limit, Statement of Hook's law</li> <li>➤ Explanation of Young's modulus, Bulk or volume modulus and rigidity modulus of elasticity,</li> <li>➤ numerical problems.</li> </ul>	<ol style="list-style-type: none"> <li>1. Explain of elasticity and plasticity</li> <li>2. Classify elastic and plastic body</li> <li>3. Explain the terms- stress,</li> <li>4. Know the types of stress</li> <li>5. Explain strain,</li> <li>6. Know the different types of strains produced on a body</li> <li>7. Define elastic limit,</li> <li>8. Know the Statement of Hook's law</li> <li>9. Explain Hook's law</li> <li>10. Know the explanation of Young's modulus, Bulk or volume modulus and rigidity modulus of elasticity,</li> <li>11. Solve numerical problems.</li> </ol>
<p>6.</p>	<p><b>6.0 PROPERTIES OF LIQUIDS:</b>  <b>6.1</b> Thrust and pressure of liquid, expression of pressure at a point inside a liquid, Laws of liquid pressure, Pascal's law of transmission of liquid, unit of pressure-<b>2hrs</b></p> <ul style="list-style-type: none"> <li>➤ explanation of Thrust and pressure of liquid</li> <li>➤ expression of pressure at a point inside a liquid,</li> <li>➤ Laws of liquid pressure,</li> <li>➤ Pascal's law of transmission of liquid, unit of pressure- Pascal.</li> </ul>	<ol style="list-style-type: none"> <li>1. Know the explanation of Thrust and pressure of liquid,</li> <li>2. Know the unit of thrust and pressure</li> <li>3. expression of pressure at a point inside a liquid,</li> <li>4. state the Laws of liquid pressure,</li> <li>5. state and explain Pascal's law of transmission of liquid,</li> <li>6. define the unit of pressure- Pascal.</li> </ol>
	<p>b. Buoyancy, Archimedes principle, Density and relative density or specific gravity of a substance. <b>1hr</b></p> <ul style="list-style-type: none"> <li>➤ Explanation of Buoyancy,</li> <li>➤ Archimedes principle, statement and explanation</li> </ul>	<ol style="list-style-type: none"> <li>1. Explain Buoyancy,</li> <li>2. Know the Archimedes principle, statement and explanation</li> <li>3. Define and explain density and relative density or specific gravity of a substance</li> <li>4. Know the unit of density and relative density</li> </ol>

	<ul style="list-style-type: none"> <li>➤ Density and relative density or specific gravity of a substance</li> <li>c. Surface tension, explanation, angle of contact, capillarity <b>1hr</b></li> <li>➤ Explanation of Surface tension,</li> <li>➤ explanation, angle of contact,</li> <li>➤ capillarity</li> <li><b>6.4</b> Viscosity, its explanation and mathematical expression, co-efficient of viscosity, poise, numerical problems. <b>1hr</b></li> <li>➤ Viscosity, its explanation and mathematical expression,</li> <li>➤ co-efficient of viscosity, poise,</li> <li>➤ numerical problems.</li> </ul>	<ol style="list-style-type: none"> <li>1. Define and explain Surface tension,</li> <li>2. Explain angle of contact,</li> <li>3. Know capillarity</li> </ol> <ol style="list-style-type: none"> <li>1. Define viscosity,</li> <li>2. Know the explanation and mathematical expression of viscosity</li> <li>3. Define co-efficient of viscosity, poise,</li> <li>4. Solve numerical problems.</li> <li>5.</li> </ol>
7.	<p><b>7.0 PROPERTIES OF GAS:</b></p> <p><b>7.1</b> Atmospheric pressure, Torricelli's experiment, expression of atmospheric pressure, Barometer, humidity, moistures in the atmosphere, relative humidity, Importance of humidity in textile technology. <b>2hrs</b></p> <ul style="list-style-type: none"> <li>➤ explanation of Atmospheric pressure,</li> <li>➤ Torricelli's experiment,</li> <li>➤ expression of atmospheric pressure,</li> <li>➤ Barometer,</li> <li>➤ humidity, moistures in the atmosphere,</li> <li>➤ relative humidity,</li> <li>➤ importance of humidity in textile technology.</li> </ul> <p><b>7.2</b> Kinetic theory of gas, postulates of Kinetic theory of gas. <b>1hr</b></p> <ul style="list-style-type: none"> <li>➤ explanation of theory of gas,</li> <li>➤ postulates of Kinetic theory of gas.</li> </ul>	<ol style="list-style-type: none"> <li>1. Know the explanation of Atmospheric pressure,</li> <li>2. Explain the Torricelli's experiment,</li> <li>3. Know the expression of atmospheric pressure,</li> <li>4. Know about Barometer,</li> <li>5. Define and explain humidity, moistures in the atmosphere,</li> <li>6. Define relative humidity,</li> <li>7. Know the importance of humidity in textile technology.</li> </ol> <ol style="list-style-type: none"> <li>1. Explain the Kinetic theory of gas</li> <li>2. Know the postulates of Kinetic theory of gas</li> </ol>
88	<p><b>8.0 HEAT:</b></p> <p><b>8.1</b> Concept of heat and temperature, measurement of temperature, different scale of temperature and their relationship, thermometer, numerical problems. <b>2hrs</b></p> <ul style="list-style-type: none"> <li>➤ Concept of heat and temperature,</li> <li>➤ measurement of temperature,</li> <li>➤ different scale of temperature and</li> </ul>	<ol style="list-style-type: none"> <li>1. Know the concept of heat and temperature,</li> <li>2. Distinguish between heat and temperature of a body</li> <li>3. Know how to measure temperature,</li> <li>4. Know the different scales of temperature and their relationship,</li> <li>5. Know the principle of thermometer,</li> <li>6. Know the conversion formula of temperature</li> <li>7. Solve numerical problems.</li> </ol> <ol style="list-style-type: none"> <li>1. Know the unit of heat,</li> </ol>

<p>their relationship,</p> <ul style="list-style-type: none"> <li>➤ thermometer,</li> <li>➤ numerical problems.</li> </ul> <p>8.2 Unit of heat, Calorie, Kilo-Calorie Joule, CHU, <b>1hr</b></p> <ul style="list-style-type: none"> <li>➤ Unit of heat,</li> <li>➤ Explanation of Calorie, Kilo-Calorie Joule, CHU</li> </ul> <p>8.3 Measurement of heat, Principle of calorimetry, Specific heat, thermal capacity and water equivalent with their mathematical expression and units. <b>1hr</b></p> <ul style="list-style-type: none"> <li>➤ Measurement of heat,</li> <li>➤ Principle of calorimetry,</li> <li>➤ Explanation of Specific heat, thermal capacity and water equivalent with their mathematical expression and units</li> </ul> <p>8.4 Thermal expansion of solid, linear, cubical and volume expansion of solid and their co-efficient of expansions. <b>2hrs</b></p> <ul style="list-style-type: none"> <li>➤ Explanation of Thermal expansion of solid,</li> <li>➤ Explanation of linear, cubical and volume expansion of solid</li> <li>➤ Relationship between the co-efficients of expansions.</li> <li>➤ Numerical problems</li> </ul> <p>8.5 Change of state of matter, cycle of change of matter, explanation of Fusion, boiling, melting and boiling point of matter, Evaporation. <b>2 hrs</b></p> <ul style="list-style-type: none"> <li>➤ Explanation of Change of state of matter,</li> <li>➤ cycle of change of matter,</li> <li>➤ explanation of Fusion, boiling, melting and boiling point of matter,</li> <li>➤ explanation of Evaporation.</li> </ul> <p>8.6 Transmission of heat, three processes of transmission,</p>	<ol style="list-style-type: none"> <li>2. Define and explain Calorie, Kilo-Calorie Joule, CHU</li> <li>3. Know the dimension of heat</li> </ol> <ol style="list-style-type: none"> <li>1. Know how to measure heat,</li> <li>2. State and explain the Principle of calorimetry,</li> <li>3. Define and explain Specific heat, thermal capacity and water equivalent</li> <li>4. Deduce their mathematical expression and units</li> </ol> <ol style="list-style-type: none"> <li>1. Define and explain Thermal expansion of solid,</li> <li>2. Know the explanation of linear, cubical and volume expansion of solid</li> <li>3. Deduce the relationship between the co-efficient of expansions.</li> <li>4. Solve numerical problems</li> </ol> <ol style="list-style-type: none"> <li>1. Explain the Change of state of matter,</li> <li>2. Know the cycle of change of matter,</li> <li>3. Explain -fusion, boiling,</li> <li>4. explain melting and boiling point of matter,</li> <li>5. Know the explanation of Evaporation.</li> </ol> <ol style="list-style-type: none"> <li>1. Know the transmission of heat,</li> <li>2. Know the different modes of transmission of heat</li> <li>3. Explain, conduction, convection and</li> </ol>
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	<p>conduction, convection and radiation. <b>1hr</b></p> <ul style="list-style-type: none"> <li>➤ Transmission of heat,</li> <li>➤ Explanation of the three processes of transmission, conduction, convection and radiation</li> </ul>	<p>radiation process of heat transfer</p> <p>4. Explain thermal conductivity of substance</p>
9	<p><b>9.0 SOUND:</b></p> <p><b>9.1</b> Wave and wave motion, Transverse and longitudinal wave and their differences, representation of wave, Definition of wave length, frequency amplitude, time period of vibration and their relationship. <b>2hrs</b></p> <ul style="list-style-type: none"> <li>➤ Explanation of Wave and wave motion,</li> <li>➤ Definition of wave length, frequency amplitude, time period of vibration and their relationship</li> <li>➤ Transverse and longitudinal wave and their differences,</li> <li>➤ representation of wave</li> </ul>	<p>1. Explain wave and wave motion,</p> <p>2. Define and explain wave length, frequency amplitude, time period of vibration</p> <p>3. Know the relationship between wavelength, wave velocity and frequency of a wave</p> <p>4. Know the transverse and longitudinal wave</p> <p>5. Distinguish between transverse and longitudinal wave</p> <p>6. Know how to represent wave</p>
	<p><b>9.2</b> Sound wave, propagation of sound wave, audible range of sound, infrasonic and ultrasonic sound. <b>1hr</b></p> <ul style="list-style-type: none"> <li>➤ Explanation of Sound wave,</li> <li>➤ propagation of sound wave,</li> <li>➤ properties of sound wave</li> <li>➤ audible range of sound, infrasonic and ultrasonic sound</li> </ul>	<p>1. Explain-Sound wave,</p> <p>2. Know the propagation of sound wave,</p> <p>3. Know the audible range of sound, infrasonic and ultrasonic sound</p>
	<p><b>9.3</b> Reflection of sound, persistence of hearing, Explanation of echo and reverberation, Acoustic of building. <b>1hr</b></p> <ul style="list-style-type: none"> <li>➤ Know the reflection of sound,</li> <li>➤ Know echo and reverberation,</li> <li>➤ Explain the persistence of hearing,</li> <li>➤ Know the Acoustic of building.</li> </ul>	<p>1. Know the reflection of sound,</p> <p>2. Explain the persistence of hearing,</p> <p>3. Explain -echo and reverberation,</p> <p>4. Know the Acoustic of building.</p>
	<p><b>9.4</b> Speed of sound in a medium, Newton's formula of velocity of sound, effects of pressure, temperature and density of medium on velocity of sound.</p> <ul style="list-style-type: none"> <li>➤ Speed of sound in a medium,</li> <li>➤ Newton's formula of velocity of</li> </ul>	<p>1. Know the Speed of sound in a medium,</p> <p>2. Deduce and explain Newton's formula of velocity of sound,</p> <p>3. Understand the effects of pressure on speed of sound</p> <p>4. the effects of temperature on speed of sound and</p>



	sound, ➤ effects of pressure, temperature and density of medium on velocity of sound.	5. effect of density of medium on velocity of sound.
	<b>9.5</b> Musical sound and noise, their differences, explanation of Doppler effect. 1hr ➤ Musical sound and noise, their differences, ➤ Explanation of Doppler effect of sound	1. Know musical sound and noise, 2. Distinguish between sound and noise 3. Explain of Doppler effect of sound.

1. **Course Title** : **PHYSICS-I PRACTICAL**
2. **Course Code** : **TT-103(P)**
3. **SEMESTER** : **SEMESTER-I**
4. **FULL MARKS** : **50**
5. **PRACTICAL EXAMINATION: 25 Marks**
6. **PRACTICAL SESSIONAL : 25 Marks**

<b>Theory</b>				<b>Practical</b>			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
-	-	-	-	25	25	50	15

**SYLLABUS**

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|---|---|
| 1.0 To find out area of a rectangle with the help of VERNIER CALLIPERS.                 | 2 |
| 2.0 To determine the volume of solid body (sphere, cube or cylinder) by slide calipers. |   |
| 3.0 To find the volume of hollow cylinder by VERNIER CALLIPERS                          | 2 |
| 4.0 To find the thickness of wall of tube by VERNIER CALLIPERS.                         | 2 |
| 5.0 To find the cross sectional area of wire or tube by SCREW GAUGE.                    | 2 |
| 6.0 To find the thickness of glass plate by spherometer.                                | 2 |
| 7.0 To determine specific gravity of a solid heavier than and insoluble in water.       | 2 |
| 8.0 To determine the specific gravity of a liquid.                                      | 2 |
| 2.0 To determine the acceleration due to gravity by simple pendulum.                    | 3 |

**XXXX**

1. **Course Title** :- ENGLISH
2. **Course Code** :- TT-104
3. **Semester** :- 1<sup>st</sup> ( First)
4. **Rationale of the subject/ Courses:-**The most commonly used medium to express oneself is language. English, being a global language, is used in all the spheres of human life i.e., personal, professional and social. A diploma student is expected to be proficient in English language and pursue the existing course of study to handle the future jobs. The content of the text includes the aspects related to language skills.

**Course Outcome:** After completion of this course student will be able to speak and write English language, its grammar and sentences.

**CO1:** Write notes on oil, SN Bose, Nuclear Power and an Interview.

**CO2:** Explain on story building on given outlines.

**CO3:** Writing of correspondence with offices, enterprises, etc .

**CO4:** Explain the correct tense, preposition and make sentences.

**5. Teaching scheme (in hours)**

Lecture	Tutorial	Practical	Total
42+3=45	0	-	45

**6.Examination Scheme**

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
70	30	<b>100</b>	30	-	-	-	-

**7. Detailed Course Content:**

Chapter No	Chapter Title	Content	Hours
Unit-I	Text	S N Bose, an interview, oil and nuclear power	10
Unit-II	Story building	Writing and imaginary story building	10
Unit-III	Letter Writing	Writing an official letter, business letter and report writing. Memos, Emails, Netiquettes, Business correspondence Letter of enquiry, Letter of Placing Orders, Letter of Complaint	12
Unit IV	Application of Grammar	<b>Articles:</b> Appropriate use of definite and indefinite Articles <b>Prepositions:</b> To use correct Prepositions as per context <b>Conjunctions:</b> Co-ordinating and sub-	10

		co-ordinating Conjunctions <b>Tenses:</b> Correct usages of past, present and future tenses <b>Active and Passive voice:</b> Use of Active and Passive voice <b>Direct and Indirect sentences:</b> Conversion of direct into indirect sentence and vice versa	
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**8. Distribution of Marks:**

Chapter No	Chapter Title	Type of Question			Total Marks
		Objective Type	Sort Questions	Descriptive Questions	
Unit I	Text	10	4	-	17
Unit II	Story Building			15	20
Unit III	Letter Writing	-	-	10	10
Unit IV	Application of Grammar	10	11	20	23
Total		20	15	45	<b>70</b>

**DETAILED TABLE OF SPECIFICATIONS**

S N	Topic	OBJECTIVE TYPE				SHORT ANSWER TYPE					ESSAY TYPE				
		K	C	A	T	K	C	A	H A	T	K	C	A	H A	T
1	Text				10					4					
2	Story Building														15
3	Letter Writing														10
4	Application of Grammar				10					11					20

K = Knowledge C = Comprehension A = Application HA = Higher Than Application T = Total

**TABLE OF SPECIFICATIONS**

Sr. No	Topic (a)	Time allotted in hours (b)	Percentage Weightage (c)	K	C	A	HA
1	Text	10		15	2	3	
2	Story Building	10		3	1	6	
3	Letter Writing	15		10	5	10	
4	Application of Grammar	10		15		10	
Total		45					

K = Knowledge                      C = Comprehension                      A = Application                      HA  
 = Higher Than Application (Analysis, Synthesis, Evaluation)

9. Suggested Implementation Strategies : The syllabus can be completed by regular classes.

10. Suggested learning Resource:

1. ESSENTIAL ENGLISH GRAMMAR by RAYMOND MURPHY CAMBRIDGE
2. HIGH SCHOOL ENGLISH GRAMMAR AND COMPOSITION by WREN AND MARTIN.

Books list :

Sl.No.	Title	Author/Publisher
1.	ESSENTIAL ENGLISH GRAMMAR	RAYMOND MURPHY CAMBRIDGE
2.	HIGH SCHOOL ENGLISH GRAMMAR AND COMPOSITION	WREN AND MARTIN
3.	ENGLISH FOR TECHNICAL STUDENT	

1. **Course Title** :-ENGINEERING DRAWING
2. **Course Code** :-TT-105
3. **Semester** :-1<sup>st</sup> Semester
4. **Rationale of the subject/ Courses** :- This course will give different inputs of drawing aspects which are used in normal engineering practices.
5. Teaching Scheme ( in hours) :-
6. Course outcome : students will be able to-
  - i. Use the drawing instruments properly.
  - ii. Draw different types of lines and patterns and different angles.
  - iii. Draw free hand lettering
  - iv. Draw plain scale & diagonal scale properly. Which is very useful in engineering practices?
  - v. Draw different types of views viz. Front view, top view, side view, as well as assembled figures clearly.
  - vi. Draw the full section, cutting planes, cutting lines clearly.

Lecture	Tutorial	Practical	Total
---	----	90 hrs ( 3 hrs Class Test)	90 hrs

**7. Examination Scheme :**

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
-	-	-	-	100	50	<b>150</b>	45

**8. Detailed Course Content :**

Chapter No	Chapter Title	Content	Duration (in Hrs)
1	INTRODUCTION	1.1 Drawing as a medium of communication 1.2 Use and care of Drawing Instruments Assignments:Such as Drawing of Horizontal and Vertical Lines, mosaic pattern, angular pattern, with circular pattern.	3 Hrs
2	Geometrical Construction (It excludes the constructions of non-circular curves)	Advantages of drawing instruments should be utilized rather the mathematical techniques. 1.1. Division of line and arc, contraction of angles, drawing of triangle, perpendicular, circular arc, square, regular polygon. To locate the centre of an arc. 1.2. To divide circle into different square parts. 1.3. To draw different tangent arcs	9 Hrs

		1.4. Centre line, body cut line(IS-696) 1.5. To draw 35 <sup>0</sup> ,45 <sup>0</sup> ,60 <sup>0</sup> ,90 <sup>0</sup> angle	
3	Techniques of Lettering	1.1. Free Hand lettering single stroke (IS-696) liner vertical or inclined type lettering. 1.2. Assignment: practice assignments	3 Hrs
4	Scales	1.1. Plain Scales 1.2. Diagonal Scales Assignments: On plain & Diagonal Scales only	9 Hrs
5	Orthographic Projection	1.1. Third angle projection of plain objects 1.2. Third angle projection of plane objects with punch holes and cylindrical features. 1.3. Multiview projection drawing with hidden features i.e. use of hidden lines. Assignments: Practice assignments. It should include the use of dimensioning.	12 Hrs
6	Sectioning	1.1. Hidden lines (IS-696) objects with hidden features. 1.2. Full Section, half section 1.3. Cutting plane line and cutting planes.(IS-696) Assignments: Practice assignments. It should include the simple block with curve on hidden features.	6 Hrs
7	Orthographic of Planes	1.1 Introduction. 1.2 A point is situated in the first quadrant. 1.3 A point is situated in the second quadrant. 1.4 A point is situated in the third quadrant.. 1.5 A point is situated in the fourth quadrant.	9 Hrs
8	Orthographic of Planes	1.1 Introduction. 1.2 Types of planes. 1.3 Projection of planes parallel to one of the reference planes. 1.4 Projection of planes inclined to one of the reference planes	12 Hrs
9	Screw Threads	1.1 Introduction. 1.2 Forms of screw threads. 1.3 Triangular or V threads. 1.4 Square thread.	6 Hrs
10	Riveted joints	1.1 Introduction. 1.2 Forms and proportions of rivet-heads. 1.3 Failure of riveted joints. 1.4 Dimensions of a riveted joint. 1.5 Types of riveted joint.	12 Hrs

		(a) Lap joint. (b) Butt joint.	
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**9. Distribution of Marks :**

Chapt No	Chapter Title	Type of Question			Total Marks
		Objective Type (Compulsory)	Short Questions	Descriptive Questions	
1	INTRODUCTION	3			3
2	Geometrical Construction	3	5		8
3	Techniques of Lettering	1		15	16
4	Scale	3		5	8
5	Orthographic Projection	3		15	18
6	Sectioning	2	6		8
7	Projection of Points	3		10	13
8	Projection of Planes	2	8		10
9	Screw Threads	2	6		8
10	Riveted Joints	3		5	8

**10. TABLE OF SPECIFICATIONS**

Sr. No	Topic (a)	Time allotted in hours(b)	Percentage Weightage (c)	K	C	A	HA
1	INTRODUCTION	3	3.70	3			
2	Geometrical Construction	9	11.12	3	5		
3	Techniques of Lettering	3	3.70	1		15	
4	Scales	9	11.12	3		5	
5	Orthographic Projection	12	14.81	3		15	
6	Sectioning	6	7.40	2	6		
7	Projection of Points	12	14.81	3		10	
8	Projection of Planes	12	14.81	2	8		
9	Screw Threads	6	7.40	2	6		
10	Riveted Joints	9	11.12	3		5	
	Total	$\Sigma b = 81$	100	25	25	50	

K = Knowledge      C = Comprehension      A = Application      HA = Higher Than Application (Analysis,

**11.Suggested implementation Strategies :**

**12.Suggested learning Resource :**



**13. Suggested Learning Resources:**

1. Elementary Engineering Drawing [Plane and Solid Geometry By N.D. Bhatt, V.M. Panchal.
2. Geometrical and Machine Drawing By N.D. Bhatt

1. **Course Title** - **WORKSHOP PRACTICE**
- 2: **Course Code** -**TT-106**
- 3: **Semester** - **1<sup>st</sup>(First)**
- 4: **Course Objective** :
- 5: **Teaching Scheme** :

Teaching Scheme			
L	T	P	T
-	-	90	90

**6: Examination Scheme :**

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
-	-	-	-	100	50	<b>150</b>	45

**7: Detailed Course Content:**

**Carpentry shop**

Content	
1. Introduction to the trade its importance in engg. Work	
2. Observation of safety in carpentry work-shop	
3. Common works: working tools, marketing & cutting tools, measuring instruments, Equipmentseg- working profile & vices.	
4. Different type of saws, their characteristics, use method of shaping (with demonstration) & their specification	
5. Different types chisel their uses & method of shaping (with demonstrations) & their specification.	
6. Different types of planes their uses & methods of shaping (with demonstrations) & their specification.	
7. Method of rough & accurate marking	
8. Sign & symbol of identifying timber, classification of timber, soft & hard	
9. Different types of carpentry joints, their names & uses (free joints, box joints, lengthening joints)	
10. Method of inspection of timber & joints.	

**Shop Practice**

Content	
1. Marketing, sawing, planning, squaring & grooving a timber piece	
2. Making a lap joint	
3. Making a through mortise & tennon joint	
4. Making a through dove tail joint	
5. Making a simple sc-rt joint & wood turning	
6. Making simple handloom parts.	
7. Marketing, sawing, planning, squaring & grooving a timber piece	
8. Making a lap joint	

9. Making a through mortise & tennon joint	
10. Making a through dove tail joint	

**Fitting Shop**

Content	
1. Role played by fitting shop & its usefulness in different industries & repair shops.	
2. Safety precaution to be observed in fitting shop	
3. Description & use fitting shop measuring instruments & equipments, their cares & maintenance eg- scale.	
4. Marking gauge, try square, callipers, surface plate, V-block, grinding machine etc. (with demonstration)	
5. Marking on a work piece (with demonstration)	
6. Description use & specification of files, hack saw, chisel, vices (with demonstration)	
7. Description use & specification of hand drill, machine drill, different types of drill bits etc. (with demonstration)	
8. Role played by fitting shop & its usefulness in different industries & repair shops.	
9. Safety precaution to be observed in fitting shop	
10. Description & use fitting shop measuring instruments & equipments, their cares & maintenance eg- scale.	
11. Marking gauge, try square, callipers, surface plate, V-block, grinding machine etc. (with demonstration)	
12. Marking on a work piece (with demonstration)	

**Shop Talk**

Content	
1. Role played by fitting shop & its usefulness in different industries & repair shops.	
2. Safety precaution to be observed in fitting shop	
3. Description & use fitting shop measuring instruments & equipments, their cares & maintenance eg- scale.	
4. Marking gauge, try square, callipers, surface plate, V-block, grinding machine etc. (with demonstration)	
5. Marking on a work piece (with demonstration)	
6. Description use & specification of files, hack saw, chisel, vices (with demonstration)	
7. Description use & specification of hand drill, machine drill, different types of drill bits etc. (with demonstration)	

**SHOP Practice**

Content	
1. Chipping, filling, squaring, scrapping, drilling, grinding, tapping & dieing operation making a simple fitting.	
2. Making a simple jobs like bolt head, keys, stud etc.	
3. Making a simple part of textile machine.	

- 1.Course Title : DEVELOPMENT OF LIFE SKILL -I**  
**2. Course Code : TT-107**  
**3. Semester : First Semester**  
**4. Rationale of the course :**

**5.Teaching Scheme (in hours)**

Lecture	Tutorial	Practical	Total
14	6	30	50

**6.Examination Scheme :**

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
-	-	-	-	25	25	<b>50</b>	15

**Aim :-This subject is kept to**

- Conduct different session to improve students memory Power
- Conduct different session to improve time management skills
- Motivate student to face realistic problem with confidence and positive approach

**Objective: - This course will enable the students to:**

- Develop reading skills
- Use techniques of acquisition of information from various sources
- Draw the notes from the text for better learning.
- Apply the techniques of enhancing the memory power.
- Develop assertive skills.
- Prepare report on industrial visit.
- Apply techniques of effective time management.
- Set the goal for personal development.
- Enhance creativity skills.
- Develop good habits to overcome stress.
- Face problems with confidence

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**DETAILED COURSE CONTENT**

**THEORY:**

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
Unit -1 <b>Importance of DLS</b>	Introduction to subject, importance in present context ,application	<b>01</b>
Unit -2 <b>Information Search</b>	Information source –Primary, secondary, tertiary Print and non – print, documentary, Electronic Information center, Library, exhibition, Government Departments. Internet Information search – Process of searching, collection of data –questionnaire, taking Interview, observation method.	<b>02</b>
Unit – 3 <b>Written communication</b>	Method of note taking Report writing –Concept, types and format.	<b>01</b>
Unit – 4 <b>Self Analysis</b>	Understanding self— Attitude, aptitude, assertiveness, self esteem, Confidence buildings.Concept of motivation.	<b>02</b>
Unit – 5 <b>Self Development</b>	Stress Management –Concept, causes, effects and remedies to Avoid / minimize stress. Health Management – Importance, dietary guidelines and exercises. Time management- Importance, Process of time planning, Urgent Vs importance, Factors leading to time loss and ways to handle it, Tips for effective time management.	
	Emotion-concept, Types, Controlling, Emotional intelligence, Creativity-concept, Factors enhancing creativity Goal setting-concept, Setting smart goal	<b>06</b>
Unit – 6 <b>Study habits</b>	Ways to enhance memory and concentration. Developing reading skill. Organisation of knowledge, Model and methods of learning.	<b>03</b>

**SUGGESTED LEARNING RESOURCES**

Reference Books:

1. Personality Development & Soft Skills - B. K. Mitra, Oxford University Press
2. Basic Managerial Skills for All - E.H. McGrath , S.J., Prentice Hall of India Pvt Ltd

3. Body Language - Allen Pease, Sudha Publications Pvt. Ltd.
4. Creativity and problem solving - Lowe and Phil, Kogan Page (I) P Ltd
5. Decision making & Problem Solving - Adair, J, Orient Longman
6. Develop Your Assertiveness - Bishop , Sue, Kogan Page India
7. Time management - Chakravarty, Ajanta, Rupa and Company
8. Life Skills Activities for Secondary Students with Special Needs - Darlene Mannix, Kindle Edition

**Internet Assistance:**

- 1) <http://www.mindtools.com>
- 2) <http://www.stress.org>
- 3) <http://www.ethics.com>
- 4) <http://www.coopcomm.org/workbook.htm>
- 5) <http://www.mapfornonprofits.org/>
- 6) <http://www.learningmeditation.com> <http://bbc.co.uk/learning/courses/>
- 7) <http://eqi.org/>
- 8) <http://www.abacon.com/commstudies/interpersonal/indisclosure.html>
- 9) <http://www.mapnp.org/library/ethics/ethxgde.htm>
- 10) [http://www.mapnp.org/library/grp\\_cnfl/grp\\_cnfl.htm](http://www.mapnp.org/library/grp_cnfl/grp_cnfl.htm)
- 11) <http://members.aol.com/nonverbal2/diction1.htm>
- 12) [http://www.thomasarmstron.com/multiple\\_intelligences.htm](http://www.thomasarmstron.com/multiple_intelligences.htm)
- 13) <http://snow.utoronto.ca/Learn2/modules.html>
- 14) <http://www.quickmba.com/strategy/swot/>

**Practical :**

**Suggested List of activities:**

- Conduct Guest Lectures.
- Conduct Industrial visits.
- Conduct Seminar/Group Discussions.

**Suggested List of Assignments/Tutorial :**

**The Term Work Will Consist Of Following Assignments.**

1 Library search:-

Visit your Institute's Library and enlist the books available on the topic given by your teacher. Prepare a bibliography consisting name of the author, title of the book, publication and place of publication.

2 Enlist the magazines, periodicals and journals being available in your library.

Select any one of them and write down its content. **Choose a topic for presentation.**

3 Attend a seminar or a guest lecture, listen it carefully and note down the important points and prepare a report of the same.

4 Visit to any one place like historical/office/farms/development sites etc. and gather information through observation, print resources and interviewing the people.

5 Prepare your individual time table for a week –

(a) List down your daily activities.

(b) Decide priorities to be given according to the urgency and importance of the activities.

(c) Find out your time wasters and mention the corrective measures.

6 Keep a diary for your individual indicating- planning of time, daily transactions, collection of good thoughts, important data, etc

7 Find out the causes of your stress that leads tension or frustration .Provide the ways to Avoid them or to reduce them.

8 Undergo the demonstration on yoga and meditation and practice it. Write your own views, feeling and experiences on it.

**NOTE: - THESE ARE THE SUGGESTED ASSIGNMENT FOR GUIDE LINES TO THE SUBJECT TEACHER. HOWEVER THE SUBJECT TEACHERS CAN SELECT, DESIGN ANY ASSIGNMENT RELEVANT TO THE TOPIC, KEEPING IN MIND THE OBJECTIVES OF THIS SUBJECT.**