

## LESSON PLAN

Program Name	DIPLOMA (Electrical . Engg.)
Course/Subject Name	Applied Physics-I
Course/Subject Code	BS103(Th) & BS107(Applied Physics -I Lab )
Course/Subject Coordinator Name	Sushil Patial
Session :	August-Dec. 2025

### Evaluation scheme

S.No.	Subject Name	Study scheme (Hrs/Week)	Marks in evaluation scheme			
			Internal Assessment		External Assessment	
			Theory	Practical	Theory	Practical
1.	Applied physic-I & Applied Physics -I Lab	3(Th)+1(DCS) +2(Pr.)	40	40	60	60
Reference books			(i) Text Book of Physics for class XI & XII : N.C.E.R.T. Delhi			
			(ii) Concept of Physics by HC Verma ,Vol I & II ,Bharti Bhawan Ltd. New Delhi			
			(iii) Applied Physics, Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, Delhi			
			(iv) Engineering Physics by DK Bhattacharya & Poonam Tandan; Oxford University Press, New Delhi			

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

CO1	Understand the importance of applied physics in describing physical phenomena.
CO2	Employ the knowledge of units and dimensions for various types of measurements.
CO3	Understand the importance of various types of errors while doing measurements.
CO4	Understand the basic forces present in the nature and their effects in daily life.
CO5	Understand energy, work, power and their importance.
CO6	Understand the basic phenomena like elasticity, surface tension, pressure etc.
CO7	Differentiate between heat and temperature and their measurements.

### Teaching Plan:

Lecture No.	Name of topic	Actual date	Remarks
1	<b>Unit-1 Units &amp; Dimensions</b> Physical quantities & Units - fundamental and derived units,		
2	systems of units (FPS, CGS and SI units)		
3	Dimensions and dimensional formulae of physical quantities (area, volume, velocity, acceleration, momentum, force, impulse, work, power, energy, surface tension, coefficient of viscosity, stress, strain, moment of inertia, gravitational constant.)		

4	Principle of homogeneity of dimensions, Dimensional equations and their applications,		
5	conversion from one system of units to other,		
6	checking of dimensional equations and derivation of simple equations)		
7	Limitations of dimensional analysis		
8	Error in measurement, absolute error, relative error, Error estimation & significant figures.		
9	<b>Unit-2 Force &amp; motion</b> Scalar and vector quantities – examples, representation of vector, types of vectors		
10	Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only),		
11	Scalar and Vector Product.		
12	Resolution of Vectors and its application to inclined plane(Rectangular components) & lawn roller		
13	Force, Momentum, Statement and Derivation of Conservation of linear momentum, its applications such as recoil of gun & rockets.		
14	Impulse and its Applications		
15	Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period.		
16	Relation between linear and angular velocity, linear acceleration and angular acceleration (related numerical)		
17	Expression and Applications of Centripetal and centrifugal forces with examples such as banking of roads and bending of cyclist.		
18	<b>Unit-3 Work, Power &amp; Energy</b> Work: and its units, examples of zero work, positive work and negative work		
19	Friction: modern concept, types, laws of limiting friction,		
20	Coefficient of friction, methods of reducing friction and its Engineering Applications		
21	Work done in moving an object on horizontal and inclined plane for rough and plane surfaces with its related applications.		
22	Energy and its units: Kinetic energy and gravitational potential energy with examples and their derivation		
23	Mechanical Energy ,Principle of conservation of mechanical energy for freely falling bodies, examples of transformation of energy(examples)		
24	Power and its units, Power and its work relationship calculation of power (numerical problems)		
25	<b>Unit-4 Rotational motion</b> Concept of translatory and rotatory motions with examples		
26	Definition of torque and angular momentum and their examples.		
27	Conservation of angular momentum (quantitative) and its		

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	examples		
28	Moment of inertia and its physical significance, radius of gyration for rigid body,		
29	Theorems of parallel and perpendicular axes (statements only), Moment of inertia of rod, disc and ring, Sphere(hollow and solid) (Formulae only )		
30	<b>Unit-5 Properties of matter</b> Elasticity: definition of stress and strain, different types of moduli of elasticity,		
31	Hooke's law, significance of stress strain curve		
32	Pressure: definition, its units, atmospheric pressure,		
33	gauge pressure, absolute pressure, Fortin's barometer and its applications.		
34	Surface tension: concept and its units, cohesive and adhesive forces, angle of contact,		
35	Ascent Formula (No derivation), applications of surface tension,		
36	effect of temperature and impurity on surface tension		
37	<b>Unit-6 Thermometry</b> Concept of heat and temperature		
38	Modes of transfer of heat (Conduction, convection and radiation with examples)		
39	Different scales of temperature and their relationship		
40	Types of Thermometer (Mercury Thermometer, Bimetallic Thermometer)		
41	Platinum resistance thermometer and pyrometer and their uses.		
42	Expansion of solids, liquids and gases,		
43	coefficient of linear, surface and cubical expansions and relation amongst them,		
44	Concept of Co-efficient of thermal conductivity		

#### Assignments:

Assignment serial	Contents of syllabus covered	Actual date	Remarks
A-1	Units, dimensions ,force and motion		
A-2	Work, power, Energy and rotational motion		
A-3	Properties of matter and thermometry		

#### House Test/Class Test:

House/Class Test	Contents of syllabus covered	Proposed Date	Actual date	Remarks
CT-I	30% of the syllabus	2 <sup>nd</sup> Week of Sept .2025		
CT-II	Next 30% of the syllabus	3 <sup>rd</sup> Week of Oct. 2025		
House Test	80% of the syllabus	2nd week of Nov. 2025		

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**Lab Plan(BS107):**

Exp. No.	Name of experiment	Actual Date		Remarks
		G-I	G-II	
1	To measure length, radius of a given cylinder and a beaker using a vernier caliper and find the volume of each object.			
2	To determine the diameter of a wire, a solid ball and thickness of cardboard using a screw gauge.			
3	To determine the radius of curvature of a convex and concave mirror using a spherometer.			
4	To verify the triangle and parallelogram law of forces.			
5	To determine force constant of spring using Hooke's law			
6	To verify the law of conservation of energy Mechanical Energy (PE & KE).			
7	To measure room temperature and temperature of a hot bath using mercury thermometer and convert it into different scales.			
8	To find the moment of inertia of fly wheel.			

  
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## LESSON PLAN

Program Name	DIPLOMA (ELECTRICAL ENGG.)
Course/Subject Name	Applied Mathematics-I
Course/Subject Code	BS- 101
Course/Subject Coordinator Name	Kharatti Lal

### Evaluation scheme

S.No.	Subject Name	Study scheme (Hrs/Week)	Marks in evaluation scheme			
			Internal Assessment		External Assessment	
			Theory	Practical	Theory	Practical
1.	Applied Mathematics-I	5	40	00	60	-
Reference books			(i)	Elementary Engineering Mathematics by Bs Grewal		
			(ii)	Applied mathematics by Dr. RD Sharma		
			(iii)	Engineering Mathematics by Dass Gupta		
			(iv)	Applied Mathematics, vol I & II by SS Sabharwal & Sunita Jain		

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

CO1	Understand the concept of Angles, its measurement and Allied angles
CO2	Understand the concept of compound angles, sub-multiple angles.
CO3	Understand the concept of Differentiation.
CO4	Able to solve the questions of differentiation and its application.
CO5	Understand the Complex Number and their fundamental operations.
CO6	Understand the concept of Partial fractions and Permutation & combination.
CO7	Understand the concept of Binomial theorem.



### Teaching Plan:

Lecture No.	Name of topic	Proposed date	Actual date	Remarks
1-5	Angles and its Measurement	08/08/2025 09,11		
6 - 9	Trigonometrical Ratio of some Allied angles	12/08/2025 14,15		
10 -11	Addition and Subtraction formulae	16/08/2025 18,19,21,		
12 - 21	Transformation of a product into a sum or a difference and vice-versa	22/08/2025 23,25,		
22 - 27	Trigonometrical ratios of Multiple angles	26/08/2025, 28,		
28-31	Trigonometrical ratios of Sub – Multiple angles	29/08/2025 30,		
32-34	Graphs of Trigonometrical functions	01/09/2025 02,04,06,		
35-37	Functions and their Limits	08/09/2025 09,12,15,		
37-39	Differentiation	11/09/2025 16,18,19,		
39-43	Applications of Differential Calculus	20/09/2025, 22,23,25,26		
43-46	Complex Number: Definition ,  real and imaginary parts of complex Numbers.  Polar &Cartesian form and representation of	27/09/2025 03/10/2025, 04  06/10/2025, 09,11,13,14 ,16,17,		

	Complex Number.			
46-51	Conjugate, Modulus & Amplitude of Complex Number .	19/10/2025 21,23,24,,		
51-57	Fundamental operations (Addition, Subtraction Multiplication & Division) of Complex Numbers.	25/10/2025 27,28,30,31 ,		
57-60	De-moivre's theorem, its application.	04/11/2025 06,		
60-62	Partial fractions (linear factors, repeated linear factors)	07/11/2025 10,11		
62-65	Permutations	13/11/2025 14,15,		
65-69	Combinations	18/11/2025 20,21		
70-73	Binomial theorem for positive index (expansion and general form).	23/11/2025 24		
73- 75	Binomial theorem for any index and applications	25/12/2025 26		

#### Assignments:

Assignment serial	Contents of syllabus covered	Proposed date	Actual date	Remarks
A-I	Trigonometry	10/09/25		

A-II	Differentiation	05/10/25		
A-III	Complex Number	10/11/25		

**House Test/Class Test:**

House/Class Test	Contents of syllabus covered	Proposed date	Actual date	Remarks
CT-I	30% of the syllabus	2nd week of September		
CT-II	Next 30% of the syllabus	3rd week of october		
House Test	80% of the syllabus	2 <sup>nd</sup> week of November		



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## LESSON PLAN

ProgramName	Diploma
Course/SubjectName	Applied Chemistry
Course/SubjectCode	BS105(Th)&BS109Applied Chemistry Lab
Course/SubjectCoordinatorName	Ms. Nisha Sharma

### Evaluation scheme

S.No.	Subject Name	Study scheme (Hrs/Week)	Marks in evaluation scheme			
			Internal Assessment		External Assessment	
			Theory	Practical	Theory	Practical
1.	Applied Chemistry +Applied Chemistry Lab	3(Th)+1(DCS) +2(Pr)	40	40	60	60
Reference books			(i) Dr. Vairam, S., Engineering Chemistry, Wiley India Pvt. Ltd., New Delhi, 2013			
			(ii) Jain & Jain, Engineering Chemistry, Dhanpat Rai, New Delhi, 2015			
			(iii) Text Book Of Chemistry for Class XI & XII (Part-I, Part-II); NCERT., Delhi, 2017-18			
			(iv) Dr. G. Hugar & Prof. A. N. Pathak Applied Chemistry Laboratory Practices, NITTTTR			
			(v) Agnihotri, Rajesh, Chemistry for Engineers, Wiley India Pvt. Ltd., 2014			

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

CO1	Solve various engineering problems by applying the basic concepts of atomic structure, chemical bonding and solution.
CO2	Understand and solve various engineering problems using concept of electrochemistry and corrosion.
CO3	Understand to analyze engineering materials, their properties and applications.
CO4	Understand the suitability of water source and use relevant water treatment for domestic and industrial application.
CO5	Use relevant fuel and lubricant for domestic and industrial application.
CO6	Understand and analyze various polymers and their application.



### Teaching Plan:

Lecture No.	Name of topic	Actual date	Remarks
1	<b>Unit-1 Atomic Structure:</b> Fundamental particles(electron,proton,neutron), Bohr's theory, successes &limitations		
2	Heisenberg uncertainty principle, Hydrogen spectrum		
3	Quantum numbers		
4	orbital concept, difference between orbit and orbital Shapes of s, p orbitals		
5	Pauli's exclusion principle, Hund's rule of maximum multiplicity Aufbau rule, electronic configuration(Z=1 to 30)		
6	<b>Unit-1Chemical Bonding and Solutions:</b> Concept of chemical bonding – cause of chemical bonding, types of bonds: ionic bonding (NaCl example) , Lewis concept of covalent bond (H <sub>2</sub> , F <sub>2</sub> , HF). Electronegativity,		
7	Difference between sigma and pie bond , Electron sea model of metallic bond, Idea of solute, solvent and solution		
8	<b>Unit-3 Electrochemistry and Corrosion:</b> Faradays laws of electrolysis and simple numerical problems		
9	Industrial application of Electrolysis – • Electrometallurgy		
10	• Electroplating		
11	• Electrolytic refining.		
12	Primary Application of redox reactions in electrochemical cells – dry cell, • Secondary cell - commercially used lead acid storage battery.		
13	Introduction to Corrosion of metals – definition, types of corrosion (electrochemical), H <sub>2</sub> liberation and O <sub>2</sub> absorption mechanism of electrochemical corrosion		
14	Internal corrosion preventive measures – Purification, alloying and heat treatment		
15	External corrosion preventive measures: metal (anodic, cathodic) coatings.		
16	<b>Unit-4 Engineering Materials:</b> Natural occurrence of metals – minerals, ores of iron, aluminium and copper, gangue (matrix), flux, slag.		
17	metallurgy – brief account of general principles of metallurgy(a).Crushing and grinding (b) Concentration of ore (Levigation)		
18	Froth flotation		
19	Magnetic separation		
20	(c) Extraction( Roasting and calcinations & smelting)		
21	(d) Refining (Electro refining, zone refining)		
22	Extraction of - iron from haematite ore using blast furnace along with reactions.		



23	Alloys – definition, purposes of alloying, ferrous alloys (Invar steel) and non-ferrous (Simple Brass & Bronze,		
24	Nichrome, Duralumin, Magnesium with suitable examples, properties and applications.		
25	<b>Unit-5 Water:</b> Classification of soft and hard water based on soap test, salts causing water hardness, Cause of poor lathering of soap in hard water		
26	units of hardness(mg/L and ppm), simple numerical on water hardness		
27	Problems caused by the use of hard water in boiler (scale and sludge, foaming and priming, corrosion.)		
28	water softening techniques- i) zeolite process		
29	ii). Municipal water treatment (in brief only) – sedimentation, coagulation, filtration, sterilization.		
30	Properties of water used for human consumption for drinking and cooking purposes from any water sources and Indian standard specification of drinking water		
31	<b>Unit-6 Fuels:</b> Definition of fuel and combustion of fuel, classification of fuels, Characteristics of good fuel		
32	calorific values (HCV and LCV), calculation of HCV and LCV using Dulong's formula		
33	Petrol and diesel - fuel rating (octane and cetane numbers), Chemical composition		
34	Calorific values and applications of LPG, CNG, water gas, producer gas and biogas.		
35	<b>Unit-7 Lubrication:</b> Function and characteristic properties of good lubricant		
36	classification with examples		
37	Lubrication mechanism: hydrodynamic and boundary lubrication		
38	Physical properties (viscosity and viscosity index, oiliness, flash and fire point, cloud and pour point		
39	Chemical properties (coke number, total acid number, saponification value) of lubricants.		
40	<b>Unit-8 Polymer :</b> Monomer, homo and co polymers , degree of polymerization, simple reactions involved in preparation and their application of thermoplastics and thermosetting plastics (using Polythene, PVC,		
41	PS,PTFE, nylon-6,6 and Bakelite ,		
42	Vulcanization of rubber and properties of vulcanised rubber		

#### Assignments:

Assignment serial	Contents of syllabus covered	Actual date	Remarks
A-1	Atomic Structure, Chemical Bonding and Solutions.		
A-2	Electrochemistry and corrosion and Engineering Materials.		



**House Test/Class Test:**

House/Class Test	Contents of syllabus covered	Actual date	Remarks
CT-I	30% of the syllabus		
CT-II	Next 30% of the syllabus		
House Test	80% of the syllabus		

**Lab Plan:**

Exp No.	Name of experiment	Actual date G-A	Actual date G-B	Remarks
1	Preparation of standard solution of oxalic acid.			
2	To determine strength of solution by titrating against standard oxalic acid solution using phenolphthalein as indicator.			
3	Experimental verification of Faraday's first law of electrolysis using copper sulfate solution and copper electrode. OR To construct and measure emf of Electro Chemical Cell(Daniel cell)			
4	Iodometric estimation of Copper in the given Copper ore using standard Hypo solution. OR To determine the percentage of Iron present in the given Haematite ore by standard Potassium Permanganate solution.			
5	Estimation of total hardness of water using standard EDTA solution and using eriochromeblack-T (solochromeblack-T) indicator and approximately neutral buffer solution (pH range 7-11). OR To estimate total alkalinity of given water sample by titrating it against standard Sulphuric acid.			
6	To estimate moisture in given coal sample gravimetrically.			
7	To estimate ash in given coal sample gravimetrically.			
8	To determine viscosity of given lubricating oil by Redwood viscometer.			



Signature of Teacher



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