



NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY  
SERGARH-756060, BALASORE (ODISHA)  
(Approved by AICTE& affiliated to SCTE&VT, Odisha)



## **LESSON PLAN**

**SUBJECT: Th.2b. ENGINEERING CHEMISTRY**

### **CHAPTER WISE DISTRIBUTION OF PERIODS**

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	Physical Chemistry	22	22
2	Inorganic Chemistry	8	8
3	Organic Chemistry	10	10
4	Industrial Chemistry	20	20
	Total Period:	60	60

Discipline: ALL BRANCHES	YEAR: 1 <sup>ST</sup>	Name of the Teaching Faculty: RAJAT KUMAR SAHOO
Week	Class Day	Theory / Practical Topics
1 <sup>st</sup>	1 <sup>st</sup>	Chapter 1: Atomic structure : Fundamental particles ( electron, proton & neutron Definition, mass and charge ).
	2 <sup>nd</sup>	Atomic mass and mass number, Definition, examples and properties of Isotopes, isobars and isotones.
	3 <sup>rd</sup>	Rutherford's Atomic model ( postulates and failure),
	4 <sup>th</sup>	Bohr's Atomic model ( Postulates only), Bohr-Bury scheme,
2 <sup>nd</sup>	1 <sup>st</sup>	Aufbau's principle, Hund's rule
	2 <sup>nd</sup>	Electronic configuration (up to atomic no 30).
	3 <sup>rd</sup>	QUESTION AND ANSWER DISCUSSION
	4 <sup>th</sup>	Chapter 2 : Chemical Bonding : Definition , types ( Electrovalent, Covalent and Coordinate bond with examples
3 <sup>rd</sup>	1 <sup>st</sup>	( formation of NaCl, MgCl <sub>2</sub> , H <sub>2</sub> , Cl <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , H <sub>2</sub> O, CH <sub>4</sub> , NH <sub>3</sub> , NH <sub>4</sub> <sup>+</sup> , SO <sub>2</sub> ).
	2 <sup>nd</sup>	QUESTION AND ANSWER DISCUSSION
	3 <sup>rd</sup>	Chapter 3 : Acid base theory : Concept of Arrhenius, Lowry Bronsted
	4 <sup>th</sup>	Lewis theory for acid and base with examples ( Postulates and limitations only). Neutralization of acid & base.
4 <sup>th</sup>	1 <sup>st</sup>	Definition of Salt, Types of salts ( Normal, acidic, basic, double, complex and mixed salts, definitions with 2 examples from each).
	2 <sup>nd</sup>	QUESTION AND ANSWER DISCUSSION
	3 <sup>rd</sup>	Chapter 4: Solutions : Definitions of atomic weight, molecular weight, Equivalent weight.
	4 <sup>th</sup>	Determination of equivalent weight of Acid, Base and Salt.
5 <sup>th</sup>	1 <sup>st</sup>	Modes of expression of the concentrations ( Molarity , Normality & Molality) with Simple Problems.
	2 <sup>nd</sup>	pH of solution ( definition with simple numericals ) Importance of pH in industry ( sugar, textile, paper industries only)
	3 <sup>rd</sup>	QUESTION AND ANSWER DISCUSSION
	4 <sup>th</sup>	Chapter 5 : Electrochemistry : Definition and types ( Strong & weak) of Electrolytes with
	1 <sup>st</sup>	Electrolysis ( Principle & process) with example of NaCl (fused and aqueous solution).

<b>6<sup>th</sup></b>	<b>2<sup>nd</sup></b>	Faraday's 1st and 2nd law of Electrolysis ( Statement, mathematical expression and Simple numerical)
	<b>3<sup>rd</sup></b>	Industrial application of Electrolysis- Electroplating ( Zinc only).
	<b>4<sup>th</sup></b>	QUESTION AND ANSWER DISCUSSION
<b>7<sup>th</sup></b>	<b>1<sup>st</sup></b>	Chapter 6 : Corrosion: Definition of Corrosion, Types of Corrosion- Atmospheric Corrosion, Waterline corrosion. Mechanism of rusting of Iron only.
	<b>2<sup>nd</sup></b>	Protection from Corrosion by (i) Alloying and (ii) Galvanization.
	<b>3<sup>rd</sup></b>	QUESTION AND ANSWER DISCUSSION
	<b>4<sup>th</sup></b>	Chapter 7 : Metallurgy: Definition of Mineral, ores , gangue with example. Distinction between Ores And Minerals
<b>8<sup>th</sup></b>	<b>1<sup>st</sup></b>	General methods of extraction of metals, i) Ore Dressing ii) Concentration ( Gravity separation, magnetic separation, Froth floatation & leaching)
	<b>2<sup>nd</sup></b>	iii) Oxidation (Calcinations, Roasting ) iv) Reduction (Smelting, Definition & examples of flux, slag) v) Refining of the metal ( Electro refining, & Distillation
	<b>3<sup>rd</sup></b>	QUESTION AND ANSWER DISCUSSION
	<b>4<sup>th</sup></b>	EXAM
<b>9<sup>th</sup></b>	<b>1<sup>st</sup></b>	Chapter 8 : Alloys: Definition of alloy. Types of alloys( Ferro, Non Ferro & Amalgam) with example.
	<b>2<sup>nd</sup></b>	Composition and uses of Brass, Bronze, Alnico, Duralumin
	<b>3<sup>rd</sup></b>	QUESTION AND ANSWER DISCUSSION
	<b>4<sup>th</sup></b>	Chapter 9 : Hydrocarbons : Saturated and Unsaturated Hydrocarbons ( Definition with
<b>10<sup>th</sup></b>	<b>1<sup>st</sup></b>	Aliphatic and Aromatic Hydrocarbons ( Huckle's rule only). Difference between Aliphatic and aromatic hydrocarbons.
	<b>2<sup>nd</sup></b>	IUPAC system of nomenclature
	<b>3<sup>rd</sup></b>	Alkane, Alkene, Alkyne,
	<b>4<sup>th</sup></b>	alkyl halide and alcohol .
<b>11<sup>th</sup></b>	<b>1<sup>st</sup></b>	Uses of some common aromatic compounds ( Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid) in daily life.
	<b>2<sup>nd</sup></b>	QUESTION AND ANSWER DISCUSSION
	<b>3<sup>rd</sup></b>	Chapter 10 : Water Treatment : Sources of water, Soft water, Hard water, hardness, types of Hardness (temporary or carbonate and permanent or non-
	<b>4<sup>th</sup></b>	Removal of hardness by lime soda method( hot lime & cold lime—Principle, process & advantages ) , Advantages of Hot lime over cold lime process.

<b>12<sup>th</sup></b>	<b>1<sup>st</sup></b>	Organic Ion exchange method ( principle, process, and regeneration of exhausted resins)
	<b>2<sup>nd</sup></b>	QUESTION AND ANSWER DISCUSSION
	<b>3<sup>rd</sup></b>	Chapter 11 : Lubricants: Definition of lubricant, Types ( solid, liquid and semisolid with
	<b>4<sup>th</sup></b>	specific uses of lubricants ( Graphite, Oils, Grease), Purpose of lubrication
<b>13<sup>th</sup></b>	<b>1<sup>st</sup></b>	QUESTION AND ANSWER DISCUSSION
	<b>2<sup>nd</sup></b>	Chapter 12 : Fuel: Definition and classification of fuel, Definition of calorific value of fuel, Choice of good fuel
	<b>3<sup>rd</sup></b>	Liquid: Diesel, Petrol, and Kerosene --- Composition and uses.
	<b>4<sup>th</sup></b>	Gaseous: Producer gas and Water gas (Composition and uses).Elementary idea about LPG, CNG and coal gas (Composition and uses only).
<b>14<sup>th</sup></b>	<b>1<sup>st</sup></b>	QUESTION AND ANSWER DISCUSSION
	<b>2<sup>nd</sup></b>	Chapter 13 : Polymer: Definition of Monomer, Polymer, Homo-polymer, Co-polymer and Degree of polymerization.
	<b>3<sup>rd</sup></b>	Difference between Thermosetting and Thermoplastic, Composition and uses of Polythene, & Poly-Vinyl Chloride and Bakelite
	<b>4<sup>th</sup></b>	Definition of Elastomer ( Rubber). Natural Rubber (it's draw backs ).
<b>15<sup>th</sup></b>	<b>1<sup>st</sup></b>	Vulcanisation of Rubber. Advantages of Vulcanised rubber over raw rubber.
	<b>2<sup>nd</sup></b>	QUESTION AND ANSWER DISCUSSION
	<b>3<sup>rd</sup></b>	Chapter 14: Chemicals in Agriculture: Pesticides: Insecticides, herbicides, fungicides- Examples and uses.
	<b>4<sup>th</sup></b>	Bio Fertilizers: Definition, examples and uses.