

**LESSON PLAN**

<b>DISCIPLINE:</b> <b>PHYSICS</b>	<b>SEMESTER:</b> <b>FIRST-</b> <b>2025(W)</b>	<b>NAME OF THE TEACHING FACULTY:</b> <b>MS. ARATI SARANGI</b> <b>HOD (PHYSICS)</b>
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<b>SUBJECT:</b> <b>APPLIED</b> <b>PHYSICS-I</b>	<b>NO. OF.</b> <b>CLASSE</b> <b>S</b> <b>ALLOT</b> <b>ED PER</b> <b>WEEK</b>	<b>SEMESTER FROM 06/08/2025 to 04/12/2025</b>
<b>WEEK</b>	<b>CLASS</b> <b>DAY</b>	<b>THEORY</b>
1ST	1st	Physical quantities, fundamental and derived units, systems of units
	2nd	Dimension and Dimensional formulae of physical quantities.
2ND	1st	Principle of homogeneity, Dimensional equations & their applications(Conversion from one system of units to other)
	2nd	Checking of Correctness of dimensional equations
3RD	1st	Derivation of simple equations, Limitation of dimensional analysis
	2nd	Measurements ,Need, Measuring instruments, Least count, Types of measurements(direct & indirect),
4TH	1st	Errors in measurements(systematic and random), Types of errors
	2nd	Error estimation,Numericals
5TH	1st	Error propagation, Numerical, Significant figures
	2nd	Classnote & Assignment Checking
6TH	1st	Work concept and units, Examples of zero work, positive work and negative work
	2nd	Friction concept, Types of friction, laws of limiting friction
7TH	1st	coefficient of friction, reducing friction and its engineering applications
	2nd	Work done in moving an object on horizontal and inclined plane for rough and plane surfaces and related applications
8TH	1st	Energy and its units, kinetic energy, gravitational potential energy with examples and derivations
	2nd	Mechanical energy, conservation of mechanical energy for freely falling bodies
9TH	1st	Transformation of energy (examples)
	2nd	Power and its units, power and work relationship
10TH	1st	Calculation of power(numerical problems)
	2nd	Class note & Assignment Checking
11TH	1st	Concept of heat and temperature, scales of temperature and their relationship
	2nd	Modes of heat transfer(conduction, convection and radiation with examples)

12TH	1st	Specific heats, numericals
	2nd	Types of thermometers(mercury thermometer, bimetallic thermometer, platinum resistance thermometer, pyrometer)
13TH	1st	Uses of thermometers
	2nd	Expansion of solids, liquids and gases
14TH	1st	Coefficient of linear, surface and cubical expansions
	2nd	Relation between expansion coefficients, numericals
15TH	1st	Co-efficient of thermal conductivity, engineering applications
	2nd	Numericals & Assignment Checking

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25/07/2025

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### LESSON PLAN

<b>DISCIPLINE: MATH &amp; SCIENCE</b>	<b>SEMESTER: FIRST- 2025(W)</b>	<b>NAME OF THE TEACHING FACULTY:TAPASWINEE PATNAIK, LECT.STAGE-II (PHYSICS)</b>
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<b>SUBJECT: APPLIED PHYSICS-I</b>	<b>NO. OF. CLASSES ALLOTTED PER WEEK</b>	<b>SEMESTER FROM 06/08/2025 to 04/12/2025</b>
<b>WEEK</b>	<b>CLASS DAY</b>	<b>THEORY</b>
1ST	1ST	Scalar & vector quantities with examples, representation of vector, types of vectors
	2ND	Addition and subtraction of vectors, Triangle and parallelogram law(statement only), numericals
2ND	1ST	Scalar and vector product, numericals
	2ND	Resolution of a vector and its application to inclined plane and lawn roller, numericals
3RD	1ST	Class Note & Assignment Checking
	2ND	Force, momentum, statement and derivation of conservation of linear momentum
4TH	1ST	Its applications such as recoil of gun, rockets
	2ND	Impulse and its applications
5TH	1ST	Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period
	2ND	Relation between linear and angular velocity, linear acceleration and angular acceleration, Numericals
6TH	1ST	Centripetal and centrifugal forces with examples
	2ND	Expression and applications such as banking of roads and bending of cyclist
7TH	1ST	Translational and rotational motions with examples
	2ND	Definition of torque and angular momentum and their examples
8TH	1ST	Conservation of angular momentum (quantitative)and its applications
	2ND	NUMERICALS, moment of inertia and its physical significance
9TH	1ST	Radius of gyration for rigid body
	2ND	Theorems of parallel and perpendicular axes(statements only)
10TH	1ST	Moment of inertia of rod, disc, ring and sphere(hollow and solid)
	2ND	Elasticity, definition of stress and strain, moduli of elasticity
11TH	1ST	Hooke's law, significance of stress-strain curve
	2ND	Pressure definition, units, atmospheric pressure, gauge pressure, absolute pressure
12TH	1ST	Fortin's barometer and its applications
	2ND	Surface tension, concept, units, cohesive and adhesive forces
13TH	1ST	Angle of contact, ascent formula, numericals
	2ND	Applications of surface tension, effect of temperature and impurity on surface tension

14TH	1ST	Viscosity and coefficient of viscosity, terminal velocity
	2ND	Stoke's law and effect of temperature on viscosity, application in hydraulic systems
15TH	1ST	Hydrodynamics: fluid motion, stream line and turbulent flow, Reynold's number equation of continuity
	2ND	Bernoulli theorem and its applications, numericals

  
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## Lesson plan of 2025-26 (1<sup>st</sup> SEMESTER)

DEPARTMENT: MATH & SCIENCE	SEMESTER: 1 <sup>st</sup> -2025(W)	NAME OF THE TEACHING FACULTY: PRABODH KUMAR SATAPATHY,SR.LECT.(CHEM)
SUBJECT: Environmental Science	NO.OF CLASSES ALLOTTED PER WEEK: 4	SEMESTER FROM : 06/08/2025 To 04/12/2025  NO.OF WEEKS:15
WEEK	CLASS DAY	THEORY TOPICS
1 <sup>st</sup>	1 <sup>st</sup>	<b>1) Ecosystem</b> i) Introduction to ecosystem
	2 <sup>nd</sup>	ii) Structure & Function of ecosystem
	3 <sup>rd</sup>	iii) Biotic & Abiotic ecosystem, Types of ecosystem with example
	4 <sup>th</sup>	iv) Food chain & food web
2 <sup>nd</sup>	1 <sup>st</sup>	v)Tropic levels , ecological pyramid
	2 <sup>nd</sup>	vi) Biogeochemical cycle , Carbon cycle
	3 <sup>rd</sup>	vii) Nitrogen cycle & phosphorus cycle
	4 <sup>th</sup>	viii) Discussion and Sulphur cycle
3 <sup>rd</sup>	1 <sup>st</sup>	ix) Global warming its cause,effect and process
	2 <sup>nd</sup>	x) Green house effect and ozone depletion
	3 <sup>rd</sup>	<b>2) Air and Noise Pollution</b> i) Introduction and definition to air pollution
	4 <sup>th</sup>	ii) Pollutants , manmade and natural sources of air pollution
4 <sup>th</sup>	1 <sup>st</sup>	iii) Refrigerants , I.C.
	2 <sup>nd</sup>	iv) Discussion & Boiler in pollution
	3 <sup>rd</sup>	v)Types of pollutants and their effect
	4 <sup>th</sup>	vi) Particulate pollutants and its effect
5 <sup>th</sup>	1 <sup>st</sup>	vii) Ways to control air pollution , Bag Filter
	2 <sup>nd</sup>	viii) Cyclone separator and Electrostatic Precipitator
	3 <sup>rd</sup>	ix) Gaseous pollution and its control - Absorber
	4 <sup>th</sup>	x) Catalytic Converter and effect of air pollution due to Refrgerants, I.C., Boiler
6 <sup>th</sup>	1 <sup>st</sup>	xi) Noise pollution and its sources
	2 <sup>nd</sup>	xii) Measurement of noise pollution and its effect
	3 <sup>rd</sup>	xiii) Regulation and control of noise pollution and the rules
	4 <sup>th</sup>	<b>3) Water and Soil Pollution</b> i) Introduction to water pollution & types of water pollutants
7 <sup>th</sup>	1 <sup>st</sup>	ii) Characteristics of water pollutants ,Discussion of turbidity
	2 <sup>nd</sup>	iii) pH, Total suspended solids
	3 <sup>rd</sup>	iv) BOD & COD :its definition & calculation
	4 <sup>th</sup>	v) Previous class discussion & Waste water treatment
8 <sup>th</sup>	1 <sup>st</sup>	vi) Primary methods ; Sedimentation process & froath flotation
	2 <sup>nd</sup>	vii) Secondary method : Activated sludge treatment
	3 <sup>rd</sup>	viii) Trickling filter & Bioreactor method

	4 <sup>th</sup>	ix) Tertiary method : Membrane separation technology & Reverse Osmosis method
9 <sup>th</sup>	1 <sup>st</sup>	x) Introduction to soil pollution ,cause ,effect & Preventive measure of Soil pollution
	2 <sup>nd</sup>	xi) Impact of excess use of fertilizers, pesticides & insecticides
	3 <sup>rd</sup>	xii) Discussion about irrigation, E-waste & Question- answer discussion
	4 <sup>th</sup>	<b>4) Renewable sources of Energy</b> i) Explanation about renewable energy & discussion of solar energy
10 <sup>th</sup>	1 <sup>st</sup>	ii) Characteristics of flat plate collector (liquid & air)
	2 <sup>nd</sup>	iii) Importance of coating, adanced collector & solar pond
	3 <sup>rd</sup>	iv) solar water heater, solar dryer & solar stills
	4 <sup>th</sup>	v) Explanation of biomass & biomass as energy source
11 <sup>th</sup>	1 <sup>st</sup>	vi) Thermal characteristics of biomass as fuel & Anaerobic digestion
	2 <sup>nd</sup>	vii) Biomass production mechanism & Utilization and storage of biogas
	3 <sup>rd</sup>	viii) The current & future propects of wind energy & wind energy in India
	4 <sup>th</sup>	ix) Environmental benefits & problems with wind energy
12 <sup>th</sup>	1 <sup>st</sup>	x) Need of new sources & different types of new energy sources
	2 <sup>nd</sup>	xi) Hydrogen energy, ocean energy, & tidal energy conversion
	3 <sup>rd</sup>	xii) Concept , origin and power plant of geothermal energy
	4 <sup>th</sup>	<b>5)Solid Waste Management, ISO 14000 &amp; Environmental Management</b> i) Introduction to solid waste & Solid waste generation
13 <sup>th</sup>	1 <sup>st</sup>	ii) Sources and characteristics of solid waste
	2 <sup>nd</sup>	iii) E-waste & Biomedical waste
	3 <sup>rd</sup>	iv) Metallic waste & Non-metallic wastes
	4 <sup>th</sup>	v) Lubricants, plastics ,rubber
14 <sup>th</sup>	1 <sup>st</sup>	vi) Collection & disposal process discussion
	2 <sup>nd</sup>	vii) Management of solid waste & methods
	3 <sup>rd</sup>	viii) 3R,Principles, energy, recovery, sanitary landfill
	4 <sup>th</sup>	ix) Air quality act 2004 & air pollution control act 1981
15 <sup>th</sup>	1 <sup>st</sup>	x) Water pollution and control act 1996 , Structure and role of central & state pollution control board
	2 <sup>nd</sup>	xi) Concept of carbon credit ,carbon footprint
	3 <sup>rd</sup>	xii) Environmental management in fabrication industry
	4 <sup>th</sup>	xiii) ISO 14000; its implementation in industries & benefits

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**GOVERNMENT POLYTECHNIC, BERHAMPUR**

**Academic Session :2025-26**

**Lesson Plan**

Discipline: <b>Civil, Elect.,CSE, Mechanical and FT</b>	Semester: <b>1st</b>	Name of the Teaching Faculty: <b>SWAPNAMAYEE BISWAL</b> <b>Lecturer in Mathematics(GF)</b>
Subject: <b>MATHEMATICS-I (TH-3)</b>	No. of Days/per week class allotted: 04	Semester From Date: <b>06.08.2025</b> To Date: <b>04.12.2025</b> No. of Weeks : 15
<b>Week</b>	<b>Class Day</b>	<b>Theory Topics</b>
1 <sup>st</sup>	1 <sup>st</sup>	UNIT - I: Trigonometry Concept of angles, measurement of angles in degrees
	2 <sup>nd</sup>	grades and radians and their conversions
	3 <sup>rd</sup>	Sum, difference formulae and their applications
	4 <sup>th</sup>	Product formulae (Transformation of product to sum, difference and vice versa)
2 <sup>nd</sup>	1 <sup>st</sup>	T- Ratios of multiple angles
	2 <sup>nd</sup>	sub-multiple angles (2A, 3A, A/2)
	3 <sup>rd</sup>	Solving Problems
	4 <sup>th</sup>	Solving Problems
3 <sup>rd</sup>	1 <sup>st</sup>	T-Ratios of Allied angles (without proof)
	2 <sup>nd</sup>	Solving Problems
	3 <sup>rd</sup>	Graphs of sin x, cos x, tan x and ex
	4 <sup>th</sup>	Solving Problems
4 <sup>th</sup>	1 <sup>st</sup>	<b>Unit– Differential Calculus</b> Definition of function; Concept of limits. Four standard limits
	2 <sup>nd</sup>	Differentiation by definition
	3 <sup>rd</sup>	Solving Problems
	4 <sup>th</sup>	Differentiation of sum, product and quotient of functions
5 <sup>th</sup>	1 <sup>st</sup>	Solving Problems
	2 <sup>nd</sup>	Solving Problems

	3 <sup>rd</sup>	Differentiation of function of a function. Differentiation of trigonometric and inverse trigonometric functions
	4 <sup>th</sup>	Solving Problems
6 <sup>th</sup>	1 <sup>st</sup>	Solving Problems
	2 <sup>nd</sup>	Logarithmic differentiation, Exponential functions
	3 <sup>rd</sup>	Solving Problems
	4 <sup>th</sup>	Solving Problems
7 <sup>th</sup>	1 <sup>st</sup>	<b>Unit- 3 Algebra</b> Sub Unit- Complex Numbers Definition, real and imaginary parts of a Complex number, polar and Cartesian
	2 <sup>nd</sup>	Representation of a complex number and its conversion from one form to other, conjugate of a complex number
	3 <sup>rd</sup>	Solving Problems
	4 <sup>th</sup>	Solving Problems
8 <sup>th</sup>	1 <sup>st</sup>	Solving Problems
	2 <sup>nd</sup>	De-moivre's theorem, its application
	3 <sup>rd</sup>	Solving Problems
	4 <sup>th</sup>	Solving Problems
9 <sup>th</sup>	1 <sup>st</sup>	Practice
	2 <sup>nd</sup>	Solving Problems
	3 <sup>rd</sup>	Representation of a complex number and its conversion from one form to other, conjugate of a complex number
	4 <sup>th</sup>	Solving Problems
10 <sup>th</sup>	1 <sup>st</sup>	<b>Unit- 3</b> Complex Numbers: Definition, real and imaginary parts of a Complex number, polar and Cartesian, representation of a complex number and its conversion from one form to other
	2 <sup>nd</sup>	conjugate of a complex number, modulus and amplitude of a complex number Addition, Subtraction
	3 <sup>rd</sup>	Advanced collector, Solar pond. Solar water heater, solar dryer, Solar stills Multiplication and Division of a complex number. De-moivre's theorem, its application
	4 <sup>th</sup>	Solving Problems

11 <sup>th</sup>	1 <sup>st</sup>	Practice
	2 <sup>nd</sup>	Partial fractions: Definition of polynomial fraction proper & improper fractions and definition of partial fractions.
	3 <sup>rd</sup>	To resolve proper fraction into partial fraction with denominator containing non-repeated linear factors
	4 <sup>th</sup>	repeated linear factors and irreducible non-repeated quadratic factors
12 <sup>th</sup>	1 <sup>st</sup>	To resolve improper fraction into partial fraction.
	2 <sup>nd</sup>	Solving Problems
	3 <sup>rd</sup>	Solving Problems
	4 <sup>th</sup>	Practice
13 <sup>th</sup>	1 <sup>st</sup>	Permutations and Combinations: Value of $nPr$ and $nCr$ .
	2 <sup>nd</sup>	Binomial theorem: Binomial theorem (without proof) for positive integral index (expansion and general form)
	3 <sup>rd</sup>	binomial theorem for any index
	4 <sup>th</sup>	first and second binomial approximation with applications to engineering problems
14 <sup>th</sup>	1 <sup>st</sup>	Solving Problems
	2 <sup>nd</sup>	Solving Problems
	3 <sup>rd</sup>	Solving Problems
	4 <sup>th</sup>	Solving Problems
15 <sup>th</sup>	1 <sup>st</sup>	Practice
	2 <sup>nd</sup>	Practice
	3 <sup>rd</sup>	Practice
	4 <sup>th</sup>	Revision of all concept

Swapnamayee Biswal  
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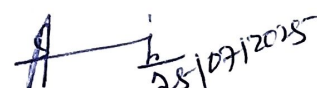
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**Lesson plan of 2025-26**  
**(1<sup>st</sup> SEMESTER)**

DEPARTMENT: MATH & SCIENCE	SEMESTER: 1 <sup>st</sup> -2025(W)	NAME OF THE TEACHING FACULTY: PRABODH KUMAR SATAPATHY,SR.LECT.(CHEM)
SUBJECT: Environmental Science	NO.OF CLASSES ALLOTTED PER WEEK: 4	SEMESTER FROM : 06/08/2025 To 04/12/2025  NO.OF WEEKS:15
WEEK	CLASS DAY	THEORY TOPICS
1 <sup>st</sup>	1 <sup>st</sup>	<b>1) Ecosystem</b> i) Introduction to ecosystem
	2 <sup>nd</sup>	ii) Structure & Function of ecosystem
	3 <sup>rd</sup>	iii) Biotic & Abiotic ecosystem, Types of ecosystem with example
	4 <sup>th</sup>	iv) Food chain & food web
2 <sup>nd</sup>	1 <sup>st</sup>	v)Tropic levels , ecological pyramid
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3 <sup>rd</sup>	1 <sup>st</sup>	ix) Global warming its cause,effect and process
	2 <sup>nd</sup>	x) Green house effect and ozone depletion
	3 <sup>rd</sup>	<b>2) Air and Noise Pollution</b> i) Introduction and definition to air pollution
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	2 <sup>nd</sup>	xii) Measurement of noise pollution and its effect
	3 <sup>rd</sup>	xiii) Regulation and control of noise pollution and the rules
	4 <sup>th</sup>	<b>3) Water and Soil Pollution</b> i) Introduction to water pollution & types of water pollutants
7 <sup>th</sup>	1 <sup>st</sup>	ii) Characteristics of water pollutants ,Discussion of turbidity
	2 <sup>nd</sup>	iii) pH, Total suspended solids
	3 <sup>rd</sup>	iv) BOD & COD :its definition & calculation
	4 <sup>th</sup>	v) Previous class discussion & Waste water treatment
8 <sup>th</sup>	1 <sup>st</sup>	vi) Primary methods ; Sedimentation process & froath flotation
	2 <sup>nd</sup>	vii) Secondary method : Activated sludge treatment
	3 <sup>rd</sup>	viii) Trickling filter & Bioreactor method

	4 <sup>th</sup>	ix) Tertiary method : Membrane separation technology & Reverse Osmosis method
9 <sup>th</sup>	1 <sup>st</sup>	x) Introduction to soil pollution ,cause ,effect & Preventive measure of Soil pollution
	2 <sup>nd</sup>	xi) Impact of excess use of fertilizers, pesticides & insecticides
	3 <sup>rd</sup>	xii) Discussion about irrigation, E-waste & Question- answer discussion
	4 <sup>th</sup>	<b>4) Renewable sources of Energy</b>
		i) Explanation about renewable energy & discussion of solar energy
10 <sup>th</sup>	1 <sup>st</sup>	ii) Characteristics of flat plate collector (liquid & air)
	2 <sup>nd</sup>	iii) Importance of coating, adanced collector & solar pond
	3 <sup>rd</sup>	iv) solar water heater, solar dryer & solar stills
	4 <sup>th</sup>	v) Explanation of biomass & biomass as energy source
11 <sup>th</sup>	1 <sup>st</sup>	vi) Thermal characteristics of biomass as fuel & Anaerobic digestion
	2 <sup>nd</sup>	vii) Biomass production mechanism & Utilization and storage of biogas
	3 <sup>rd</sup>	viii) The current & future propects of wind energy & wind energy in India
	4 <sup>th</sup>	ix) Environmental benefits & problems with wind energy
12 <sup>th</sup>	1 <sup>st</sup>	x) Need of new sources & different types of new energy sources
	2 <sup>nd</sup>	xi) Hydrogen energy, ocean energy, & tidal energy conversion
	3 <sup>rd</sup>	xii) Concept , origin and power plant of geothermal energy
	4 <sup>th</sup>	<b>5)Solid Waste Management, ISO 14000 &amp; Environmental Management</b>
13 <sup>th</sup>	1 <sup>st</sup>	i) Introduction to solid waste & Solid waste generation
	2 <sup>nd</sup>	ii) Sources and characteristics of solid waste
	3 <sup>rd</sup>	iii) E-waste & Biomedical waste
	4 <sup>th</sup>	iv) Metallic waste & Non-metallic wastes
14 <sup>th</sup>	1 <sup>st</sup>	v) Lubricants, plastics ,rubber
	2 <sup>nd</sup>	vi) Collection & disposal process discussion
	3 <sup>rd</sup>	vii) Management of solid waste & methods
	4 <sup>th</sup>	viii) 3R,Principles, energy, recovery, sanitary landfill
15 <sup>th</sup>	1 <sup>st</sup>	ix) Air quality act 2004 & air pollution control act 1981
	2 <sup>nd</sup>	x) Water pollution and control act 1996 , Structure and role of central & state pollution control board
	3 <sup>rd</sup>	xi) Concept of carbon credit ,carbon footprint
	4 <sup>th</sup>	xii) Environmental management in fabrication industry
		xiii) ISO 14000; its implementation in industries & benefits

  
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**GOVERNMENT POLYTECHNIC, BERHAMPUR**

Academic Session :2025-26

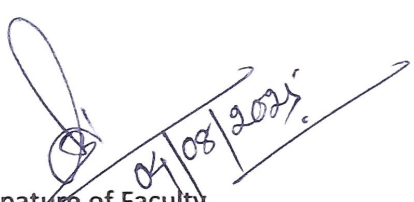
**Lesson Plan**

Discipline: Civil, Elect.,CSE, Mechanical and FT	Semester:1st	Name of the Teaching Faculty: <b>BIPIN BIHARI MOHANTY</b> Lecturer in Chemistry(Stage-II)
Subject: <b>Environmental Science(Th.5)</b>	No. of Days/per week class allotted: 04	Semester From Date: <b>06.08.2025</b> To Date: <b>04.12.2025</b> No. of Weeks : 15
<b>Week</b>	<b>Class Day</b>	<b>Theory Topics</b>
1 <sup>st</sup>	1 <sup>st</sup>	<b>Unit-1 Ecosystem:</b> Structure of ecosystem, Biotic & Abiotic components
	2 <sup>nd</sup>	Food chain : types & examples
	3 <sup>rd</sup>	Food web : types & examples
	4 <sup>th</sup>	Aquatic Ecosystem (Lentic and Lotic)
2 <sup>nd</sup>	1 <sup>st</sup>	Terrestrial ecosystem , examples
	2 <sup>nd</sup>	Carbon Cycle
	3 <sup>rd</sup>	Nitrogen Cycle
	4 <sup>th</sup>	Sulphur cycle
3 <sup>rd</sup>	1 <sup>st</sup>	Phosphorus Cycle
	2 <sup>nd</sup>	Global warming -Causes, effects, process
	3 <sup>rd</sup>	Green House Effect
	4 <sup>th</sup>	Ozone Depletion
4 <sup>th</sup>	1 <sup>st</sup>	<b>Unit- 2 Air and, Noise Pollution:</b> Definition of pollution and pollutant, Natural and manmade sources of air pollution
	2 <sup>nd</sup>	Refrigerants, I.C., Boiler
	3 <sup>rd</sup>	Air Pollutants: types & examples
	4 <sup>th</sup>	Particulate Pollutants
5 <sup>th</sup>	1 <sup>st</sup>	Effects and control :Bag Filter
	2 <sup>nd</sup>	Effects and control :Cyclone Separator
	3 <sup>rd</sup>	Effects and control :Electrostatic Precipitator
	4 <sup>th</sup>	Gaseous Pollution Control: Absorber, Catalytic Converter
6 <sup>th</sup>	1 <sup>st</sup>	Effects of Air pollution due to Refrigerants, I.C., Boiler
	2 <sup>nd</sup>	Noise Pollution: sources of pollution, measurement of pollution level
	3 <sup>rd</sup>	Effects of Noise Pollution
	4 <sup>th</sup>	Noise pollution (Regulation and Control) Rules, 2000
7 <sup>th</sup>	1 <sup>st</sup>	<b>Unit- 3 Water and Soil Pollution :</b> Sources of water pollution, Types of water pollutants ,Characteristics of water pollutants
	2 <sup>nd</sup>	Turbidity and pH of water


	3 <sup>rd</sup>	Total suspended solids, Total solids in water sample
	4 <sup>th</sup>	BOD: Definition, calculation
8 <sup>th</sup>	1 <sup>st</sup>	COD: Definition, calculation
	2 <sup>nd</sup>	Waste Water Treatment: Primary methods: sedimentation, froth floatation
	3 <sup>rd</sup>	Secondary methods: Activated sludge treatment, Trickling filter, Bioreactor
	4 <sup>th</sup>	Tertiary Method: Membrane separation technology, RO (reverse osmosis)
9 <sup>th</sup>	1 <sup>st</sup>	Causes of Soil Pollution: Excessive use of Fertilizers, Pesticides and Insecticides, Irrigation
	2 <sup>nd</sup>	Soil Pollution by E-Waste
	3 <sup>rd</sup>	Effects of Soil Pollution
	4 <sup>th</sup>	Preventive measures of Soil Pollution
10 <sup>th</sup>	1 <sup>st</sup>	<b>Unit- 4 Renewable sources of Energy:</b> Solar Energy: Basics of Solar energy. Flat plate collector (Liquid & Air)
	2 <sup>nd</sup>	Theory of flat plate collector. Importance of coating
	3 <sup>rd</sup>	Advanced collector, Solar pond. Solar water heater, solar dryer, Solar stills
	4 <sup>th</sup>	Biomass: Overview of biomass as energy source
11 <sup>th</sup>	1 <sup>st</sup>	Thermal characteristics of biomass as fuel. Anaerobic digestion. Biogas production mechanism
	2 <sup>nd</sup>	Utilization and storage of biogas.
	3 <sup>rd</sup>	Wind energy: Current status and future prospects of wind energy, Wind energy in India. Environmental benefits and problem of wind energy
	4 <sup>th</sup>	New Energy Sources: Need of new sources. Different types new energy sources
12 <sup>th</sup>	1 <sup>st</sup>	Applications of Hydrogen energy
	2 <sup>nd</sup>	Applications of Ocean energy resources
	3 <sup>rd</sup>	Applications of Tidal energy conversion
	4 <sup>th</sup>	Concept, origin and power plants of geothermal energy
13 <sup>th</sup>	1 <sup>st</sup>	<b>Unit-5 Solid Waste Management, ISO 14000 &amp; Environmental Management:</b> Solid waste generation- Sources and characteristics of: Municipal solid waste, E- waste, biomedical waste.
	2 <sup>nd</sup>	Metallic wastes and Non-Metallic wastes (lubricants, plastics, rubber) from industries
	3 <sup>rd</sup>	Collection and disposal: MSW (3R principles, energy recovery, sanitary landfill)
	4 <sup>th</sup>	Hazardous waste
14 <sup>th</sup>	1 <sup>st</sup>	Air quality act 2004, air pollution control act 1981
	2 <sup>nd</sup>	Water pollution and control act 1996
	3 <sup>rd</sup>	Structure and role of Central Pollution Control Board
	4 <sup>th</sup>	Structure and role of State Pollution Control Board

15 <sup>th</sup>	1 <sup>st</sup>	Concept of Carbon Credit
	2 <sup>nd</sup>	Concept of Carbon Footprint
	3 <sup>rd</sup>	Environmental management in fabrication industry
	4 <sup>th</sup>	ISO14000: Implementation in industries, Benefits

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