

Government Polytechnic Nanakpur(PKL)

Lesson Plan

Discipline- Applied Science

Semester – 2nd Sem

Subject –Applied Mathematics

Duration –16 weeks

Work load (per week)-: lectures-04

<i>Week</i>	<i>Theory</i>			
	<i>Lect. day</i>	<i>Topic</i>		
1st	1st	UNIT I _____		
		Definition of function; Concept of limits (Introduction only) and problems related to four standard limits only.		
	2nd	Differentiation of x^n , $\sin x$, $\cos x$, e^x by first principle.		
	3rd	Differentiation of sum, product and quotient of functions.		
	4th	Revision Unit- I		
2nd	1st	Revision Unit- I		
	2nd	UNIT II Differential Calculus and Its Applications Differentiation of trigonometric functions, inverse trigonometric functions.		
	3rd	Logarithmic differentiation, successive differentiation (upto 2nd order)		
	4th	Application of differential calculus in: (a) Rate measures		

3 rd	1 st	(b) Maxima and minima		
	2 nd	Revision Unit- 2		
	3 rd	Revision Unit- 2		,
	4 th	Revision Unit- 2		
4 th	1 st	UNIT III Integral Calculus Integration as inverse operation of differentiation with simple examples.		
	2 nd	Simple standard integrals and related problems, Integration by Substitution method and Integration by parts.		
	3 rd	Evaluation of definite integrals with given limits. $\pi/2 \pi/2 \pi/2$ Evaluation of $\int \sin x$ $\int \cos x$, $\int \sin mx$ $\int \cos nx$ $\int \frac{1}{x}$ $\int \frac{1}{x^2}$ 0 0 0 using formulae without proof (m and n being positive integers only) using pre-existing mathematical models.		
	4 th	Revision Unit- 3		
5 th	1 st	Revision-Unit-3		
	2 nd	Revision-Unit-3		
	3 rd	UNIT IV Application of Integration, Numerical Integration and Differential Equations Applications of integration: for evaluation of area under a curve and axes (Simple problems).		
	4 th	Numerical integration by Trapezoidal Rule		
6 th	1 st	Simpson's 1/3rd Rule using pre-existing mathematical models.		

	2 nd	Revision-Unit-4		
	3 rd	Revision-Unit-4		
	4 th	Revision-Unit-4		
7 th	1 st	Differential Equations Definition, order, degree, Type of differential Equations, linearity,		
	2 nd	Formulation of ordinary differential equation (up to 1st order), solution of ODE (1st order) by variable separation method.		
	3 ^{rd^h}	Revision-Unit-4		
	4 ^{thⁱ}	Revision-Unit-4		
8 th	1 st	UNIT V Statistics and Software Statistics Measures of Central Tendency: Mean, Median, Mode		
	2 nd	Measures of Dispersion: Mean deviation		
	3 rd	Standard Deviation, variance, coefficient of standard deviation		
	4 th	Revision Statistics		
9 th	1 st	Revision Statistics		
	2 nd	Revision Statistics		
	3 rd	Software SciLab software – Theoretical Introduction.		
	4 th	Basic difference between MATLAB and SciLab software,		
10 TH	1 st	Calculations with MATLAB or SciLab - (a) Representation of matrix (2×2 order), (b) Addition, Subtraction of matrices (2×2 order) in MATLAB or SciLab		

	<i>2nd</i>	Revision- MATLAB		
	<i>3rd</i>	Revision- MATLAB		
	<i>4th</i>	Revision- MATLAB		
11TH	<i>1st</i>	Revision- MATLAB		
	<i>2nd</i>	Revision- MATLAB		
	<i>3rd</i>	Functions and limits		
	<i>4th</i>	Differentiation of Trigonometric function		
12th	<i>1st</i>	Differentiation of logarithmic function and infinite series function		
	<i>2nd</i>	Integration of simple standard function		
	<i>3rd</i>	Integration of trigonometric function		
	<i>4th</i>	Integration by parts		
13th	<i>1st</i>	Application of integration		
	<i>2nd</i>	Numerical integration		
	<i>3rd</i>	Differential Equation		
	<i>4th</i>	Solution of ODE in differential Equation		
14th	<i>1st</i>	Revision- Unit-1		
	<i>2nd</i>	Revision- Unit-1		
	<i>3rd</i>	Revision- Unit-2		
	<i>4th</i>	Revision- Unit-2		

15th	<i>1st</i>	Revision- Unit-3		
	<i>2nd</i>	Revision- Unit-3		
	<i>3rd</i>	Revision- Unit-4		
	<i>4th</i>	Revision- Unit-4		
16th	<i>1st</i>	Revision- Unit-5		
	<i>2nd</i>	Revision- Unit-5		
	<i>3rd</i>	Revision- Unit-5		
	<i>4th</i>	Revision- Unit-5		

LESSON PLAN

Discipline : CSE/Civil/Mech./ECE/Electrical Engg.

Semester : 2nd Sem

Subject : Applied Physics-II

Lesson Plan Duration : -15 weeks

Work Load (Lecture/Practical) per week (in hours) : Lecture – 02 , Practicals -02

Week	Theory		Practical	
	Lecture day	Topic (including assignment/test)	Practical day	Topic
1	1	<ul style="list-style-type: none"> Wave motion - Introduction 	1	Familiarization with apparatus (resistor, rheostat, key, ammeter, volt meter, telescope, microscope etc)
	2	<ul style="list-style-type: none"> Terms - displacement, amplitude, time period, frequency, wavelength, wave velocity, 		
	3	<ul style="list-style-type: none"> Transverse wave motion 		
	4	<ul style="list-style-type: none"> longitudinal wave motion 		
2	5	<ul style="list-style-type: none"> Difference b/w Transverse & longitudinal wave motion 		
	6	<ul style="list-style-type: none"> relationship among wave velocity, frequency and wave length . Simple Harmonic Motion (SHM): definition, examples 		
3	7	<ul style="list-style-type: none"> Cantilever Vibrations & its types 	2	To find the time period of simple pendulum
	8	<ul style="list-style-type: none"> Acoustics of buildings – reverberation reverberation time 		
	9	<ul style="list-style-type: none"> Echo, noise, coefficient of absorption of sound 		

	10	<ul style="list-style-type: none"> • methods to control reverberation time. 		
	11	<ul style="list-style-type: none"> • Ultrasonics 	3	To study variation of time period of a simple pendulum with change in length of pendulum
	12	<ul style="list-style-type: none"> • Engineering applications of Ultrasonics 		
4	13	<ul style="list-style-type: none"> • Optics – Introduction 		
	14	<ul style="list-style-type: none"> • Reflection of Light • Refraction of Light 		
	15	<ul style="list-style-type: none"> • refractive index • Total internal reflection • Critical angle 	4	To find and verify the time period of cantilever
	16	<ul style="list-style-type: none"> • Applications of TIR • conditions for TIR 		
5	17	<ul style="list-style-type: none"> • Super Position of Waves, Definition of Interference, Diffraction and Polarization of Waves • Microscope, telescope& their uses 		
	18	<ul style="list-style-type: none"> • Introduction of Lens, lens Formula (no derivation), Power of Lens • Based numerical 		
	19	<ul style="list-style-type: none"> • Assignment – Ultrasonics 	5	To find Ohm’s laws by plotting a graph between voltage and current
	20	<ul style="list-style-type: none"> • Test 		
6	21	<ul style="list-style-type: none"> • Electrostatics and Electricity – Introduction 		
	22	<ul style="list-style-type: none"> • Coulombs law • Unit charge 		
7	23	<ul style="list-style-type: none"> • Electric field • Electric lines of force,its properties 	6	To study colour coding scheme of resistance
	24	<ul style="list-style-type: none"> • Electric Intensity • Electric Flux 		
8	25	<ul style="list-style-type: none"> • Electric potential • Electric field intensity due to a point charge. 		
	26	<ul style="list-style-type: none"> • Gauss law(Statement and derivation) 		
	27	<ul style="list-style-type: none"> • Capacitor • Capacitance 	7	To verify laws of resistance in series combination
9	28	<ul style="list-style-type: none"> • Series combination of capacitors 		
	29	<ul style="list-style-type: none"> • parallel combination of capacitors • Ohm’s Laws 		
10	30	<ul style="list-style-type: none"> • Numerical based on Grouping of capacitors 		

	31	<ul style="list-style-type: none"> Classification of Materials and their Properties 	8	To verify laws of resistance in parallel combination
11	32	<ul style="list-style-type: none"> Types of materials Conductor, Semi-Conductor, Insulator and Dielectric with examples 		
	33	<ul style="list-style-type: none"> intrinsic and extrinsic semiconductors (Introduction only) 	9	To find resistance of galvanometer by half deflection method
12	34	<ul style="list-style-type: none"> Introduction to Magnetism Types of magnetic materials Dia materials with example 		
	35	<ul style="list-style-type: none"> para and ferromagnetic materials with examples 	10	To verify laws of reflection of light using mirror
	36	<ul style="list-style-type: none"> Magnetic field magnetic Flux 		
13	37	<ul style="list-style-type: none"> Magnetic lines of force 	11	To verify laws of refraction using glass slab
	38	<ul style="list-style-type: none"> Electromagnetic induction (Definition) 		
	39	Test	12	To find the focal length of a concave lens using a convex lens
14	40	Modern Physics - Introduction		
	41	<ul style="list-style-type: none"> Lasers: full form, Principle, absorption, spontaneous emission, stimulated emission, population inversion Engineering and applications of laser 	13	revision
15	42	<ul style="list-style-type: none"> Fibre optics – Definition, principle, parts, light propagation, fiber types (mono-mode, multi-mode) Applications in medical, tele-communication and sensors 		
	43	<ul style="list-style-type: none"> Introduction to nanotechnology- Definition of nano materials with examples, properties at nano scale 	14	revision
	44	<ul style="list-style-type: none"> Applications of nanotechnology(brief) 		
16		<ul style="list-style-type: none"> Revision and test 	15	revision

Government Polytechnic Nanakpur, Panchkula

Lesson Plan

Discipline- Applied Science

Semester – 2nd Sem.

Subject –EVS & DM

Duration – 16 weeks

Work load (per week):- Lectures-02

Week	Theory	
	Lect. day	Topic
1st	1 st	UNIT I Introduction: Basics of ecology, eco system- concept,
	2 nd	sustainable development,
2 nd	1 st	Sources, advantages, disadvantages of renewable and nonrenewable energy.
	2 nd	Rain water harvesting
3rd	1 st	Deforestation – its effects & control measures
	2 nd	Revision
4 th	1 st	Revision
	2 nd	Revision
5 th	1 st	UNIT II Air and Noise Pollution: Air Pollution: Source of air pollution. Effect of air pollution on human health,
	2 nd	economy, Air pollution control methods.
6 th	1 st	Noise Pollution: Source of noise pollution,
	2 nd	Unit of noise,
7 th	1 st	Effect of noise pollution, Acceptable noise level,

8 th	2 nd	Different method of minimizing noise pollution.
	1 st	Water Pollution: Impurities in water, Cause of water pollution,
9 th	2 nd	Source of water pollution. Effect of water pollution on human health,
	1 st	Concept of DO, BOD, COD. Prevention of water pollution-
10 th	2 nd	Water treatment processes, Sewage treatment. Water quality standard.
	1 st	Soil Pollution :Sources of soil pollution, Effects and Control of soil pollution,
11 th	2 nd	Types of Solid waste- House hold, Industrial, Agricultural, Biomedical,
	1 st	Disposal of solid waste,
12 th	2 nd	Solid waste management E-waste, E – waste management
	1 st	UNIT IV Impact of Energy Usage on Environment
13 th	2 nd	Global Warming, Green House Effect,
	1 st	Depletion of Ozone Layer, Acid Rain. Eco-friendly Material,
14 th	2 nd	Recycling of Material,
	1 st	Concept of Green Buildings,
15 th	2 nd	Concept of Carbon Credit & Carbon footprint.
	1 st	UNIT V Disaster Management A. Different Types of Disaster: Natural Disaster: such as Flood, Cyclone, Earthquakes and Landslides
16 th	2 nd	Man-made Disaster: such as Fire, Industrial Pollution, Nuclear Disaster, Biological Disasters,
	1 st	Accidents (Air, Sea Rail & Road), Structural failures(Building and Bridge), War & Terrorism etc.
	2 nd	B. Disaster Preparedness: Disaster Preparedness Plan Prediction, Early Warnings and Safety Measures of Disaster Psychological response and Management (Trauma, Stress, Rumour and Panic)

Government Polytechnic Nanakpur (Panchkula)

Lesson Plan

Discipline- Applied Science

Semester – 2nd Sem

Subject –Applied chemistry

Duration –16 weeks

Work load (per week):- Lectures-03 Practical :02

Week	Theory		Practical	
	Lect. day	Topic	Lect. day	Topic
1 st	1 st	UNIT 1 Atomic Structure, Periodic Table and Chemical Bonding.	1 st	To prepare standard solution of oxalic acid.
	2 nd	Bohr's model of atom (qualitative treatment only), dual character of matter: derivation of de-Broglie's equation,	2 nd	To prepare standard solution of oxalic acid.
	3 rd	Heisenberg's Principle of Uncertainty,		
2 nd	1 st	modern concept of atomic structure: definition of orbitals, shapes of s, p and d-orbitals, quantum numbers and their	1 st	To prepare standard solution of oxalic acid.
	2 nd	Electronic configuration: Aufbau and Pauli's exclusion principles and Hund's rule, electronic configuration of elements up to atomic number 30.	2 nd	To prepare standard solution of oxalic acid.
	3 rd	Modern Periodic law and Periodic table,		
3 rd	1 st	classification of elements into s, p, d and f-blocks, metals, non-metals and metalloids (periodicity in properties excluded).	1 st	To dilute the given KMnO ₄ solution

	2 nd	Chemical bonding: cause of bonding, ionic bond, covalent bond, and metallic bond (electron sea or gas model), Physical properties of ionic, covalent and metallic substances.		To dilute the given KMnO ₄ solution
	3 rd	Revision	2 nd	
3 rd	1 st	UNIT II Metals and Alloys: Metals: mechanical properties of metals such as conductivity, elasticity, strength and stiffness, luster, hardness, toughness, ductility, malleability, brittleness, and impact resistance and their uses.	1 st	To dilute the given KMnO ₄ solution
	2 nd	Definition of a mineral, ore, gangue, flux and slag.	2 nd	To dilute the given KMnO ₄ solution
	3 rd	Metallurgy of iron from haematite using a blast furnace. Commercial varieties of iron.	1 st	To find out the strength in grams per litre of an unknown solution of sodium hydroxide using a standard (N/10) oxalic acid solution.
4 th	1 st	Alloys: definition, necessity of making alloys, composition, properties and uses of duralumin and steel.	2 nd	To find out the strength in grams per litre of an unknown solution of sodium hydroxide using a standard (N/10) oxalic acid solution.
	2 nd	Heat treatment of steel-normalizing, annealing, quenching, tempering.	1 st	To find out the strength in grams per litre of an unknown solution of sodium hydroxide using a standard (N/10) oxalic acid solution.
	3 rd	UNIT III Water, Solutions, Acids and Bases	2 nd	To find out the strength in grams per litre of an unknown solution of sodium hydroxide using a standard (N/10) oxalic acid solution.

	4 th	Solutions: definition, expression of the concentration of a solution in percentage (w/w, w/v and v/v), normality, molarity and molality and ppm. Simple problems on solution preparation.	1 st	To find out the total alkalinity in parts per million (ppm) of a water sample with the help of a standard sulphuric acid solution.
5 th	1 st	Arrhenius concept of acids and bases, strong and weak acids and bases, pH value of a solution and its significance, pH scale. Simple numerical problems on pH of acids and bases.	2 nd	To find out the total alkalinity in parts per million (ppm) of a water sample with the help of a standard sulphuric acid solution.
	2 nd	Hard and soft water, causes of hardness of water, types of hardness – temporary and permanent hardness, expression of hardness of water, ppm unit of hardness; disadvantages of hard water; removal of hardness: removal of temporary hardness by boiling and Clark's method;		To determine the total hardness of given water sample by EDTA method
	3 rd	removal of permanent hardness of water by Ion-Exchange method; boiler problems caused by hard water: scale and sludge formation, priming and foaming, caustic embrittlement; water sterilization by chlorine, UV radiation and RO.		To determine the total hardness of given water sample by EDTA method
6 th	1 st	UNIT IV Fuels and Lubricants 4.1 Fuels: definition and classification of higher and lower calorific values, units of calorific value, characteristics of an ideal fuel.		To determine the amount of total dissolved solids(TDS) in ppm in a given sample of water gravimetrically
	2 nd	Petroleum: composition and refining of petroleum;		To determine the amount of total dissolved solids(TDS) in ppm in a given sample of water

			gravimetrically
	3 rd	<i>composition, properties and uses of CNG, PNG, LNG, LPG; relative advantages of liquid and gaseous fuels over solid fuels. Scope of hydrogen as future fuel.</i>	<i>To determine the pH of different solutions using a digital pH meter.</i>
7 th	1 st	<i>Lubricants- Functions and qualities of a good lubricant, classification of lubricants with examples;</i>	<i>To determine the pH of different solutions using a digital pH meter.</i>
	2 nd	<i>Lubrication mechanism (brief idea only); physical properties (brief idea only) of a lubricant: oiliness, viscosity, viscosity index, flash and fire point, ignition temperature, pour point.</i>	<i>To determine the calorific value of a solid/liquid fuel using a Bomb calorimeter.</i>
	3 rd	<i>Lubrication mechanism (brief idea only); physical properties (brief idea only) of a lubricant: oiliness, viscosity, viscosity index, flash and fire point, ignition temperature, pour point.</i>	<i>To determine the calorific value of a solid/liquid fuel using a Bomb calorimeter.</i>

8 th	1 st	UNIT V	
	2 nd	Polymers and Electrochemistry	To determine the viscosity of a lubricating oil using a Redwood viscometer
9 th	3 rd	<i>Polymers and Plastics: definition of polymer, classification, addition and condensation</i> <i>polymerization; preparation properties and uses of polythene, PVC, Nylon-66, Bakelite;</i>	To determine the viscosity of a lubricating oil using a Redwood viscometer
	1 st	<i>definition of plastic, thermoplastics and thermosetting polymers; natural rubber and</i>	To prepare a sample of Phenol-formaldehyde resin (Bakelite)/Nylon-66 in the lab.
	2 nd	<i>neoprene, other synthetic rubbers (names only).</i>	
10 th	3 rd	<i>Corrosion: definition, dry and wet corrosion</i>	To prepare a sample of Phenol-formaldehyde resin (Bakelite)/Nylon-66 in the lab.
	1 st	<i>factors affecting rate of corrosion, methods of</i>	To prepare a sample of Phenol-formaldehyde resin (Bakelite)/Nylon-66 in the lab.
	2 nd	<i>prevention of corrosion</i>	
	3 rd	<i>hot dipping, metal cladding, cementation, quenching, cathodic protection methods</i>	To prepare a sample of Phenol-formaldehyde resin (Bakelite)/Nylon-66 in the lab.
11 th	1 st	<i>methods of</i>	Viva Voice
	2 nd	<i>prevention of corrosion—hot dipping, metal cladding, cementation, quenching, cathodic protection methods</i>	
	3 rd	<i>Introduction and application of nanotechnology: nano-materials and their classification, applications of nanotechnology in various engineering applications</i>	
12 th	1 st	Revision	Viva Voice
	2 nd	Revision	

13 th	3 rd	Revision	Viva Voice
	1 st	Revision	
	2 nd	Revision	Viva Voice
14 th	3 rd	Revision	Viva Voice
	1 st		Viva Voice
	2 nd	Revision	Viva Voice
15 th	3 rd	Revision	Viva Voice
	1 st	Revision	Revision and file checking
	2 nd		Revision and file checking
16 th	3 rd	Revision	Revision and file checking
	1 st	Revision	Revision and file checking
	2 nd	Revision	Revision and file checking

