

Discipline All branch	Semester 1 <sup>st</sup>	Name of Teaching Faculty Bikash Kumar Naik, Lect. In Physics, Math & Science Dept. Govt. Polytechnic, Balangir
Week	No. of Class/week-4	Theory Semester from date : 16.08.19 to 30.11.2019 No. of weeks :- 16 (excluding puja vacation)
1 <sup>st</sup>	1 <sup>st</sup>	Physical quantities - (Definition).
	2 <sup>nd</sup>	Definition of fundamental and derived units, systems of units (FPS, CGS, MKS and SI units).
	3 <sup>rd</sup>	Definition of dimension and Dimensional formulae of physical quantities.
	4 <sup>th</sup>	Dimensional equations and Principle of homogeneity. Checking the dimensional correctness of Physical relations.
2 <sup>nd</sup>	1 <sup>st</sup>	Scalar and Vector quantities (definition and concept), Representation of a Vector – examples, types of vectors.
	2 <sup>nd</sup>	Triangle and Parallelogram law of vector Addition (Statement only). Simple Numerical.
	3 <sup>rd</sup>	Resolution of Vectors – Simple Numericals on Horizontal and Vertical components.
	4 <sup>th</sup>	Vector multiplication (scalar product and vector product of vectors).
3 <sup>rd</sup>	1 <sup>st</sup>	Concept of Rest and Motion.
	2 <sup>nd</sup>	Displacement, Speed, Velocity, Acceleration & FORCE (Definition, formula, dimension & SI units).
	3 <sup>rd</sup>	Equations of Motion under Gravity (upward and downward motion) - no derivation.
	4 <sup>th</sup>	Circular motion: Angular displacement, Angular velocity and Angular acceleration (definition, formula & SI units).
4 <sup>th</sup>	1 <sup>st</sup>	Relation between –(i) Linear & Angular velocity, (ii) Linear & Angular acceleration).
	2 <sup>nd</sup>	Define Projectile, Examples of Projectile. Expression for Equation of Trajectory, Time of Flight, Maximum Height and Horizontal Range for a projectile fired at an angle, Condition for maximum Horizontal Range.
	3 <sup>rd</sup>	Work – Definition, Formula & SI units.
	4 <sup>th</sup>	Friction – Definition & Concept.
5 <sup>th</sup>	1 <sup>st</sup>	Types of friction (static, dynamic), Limiting Friction (Definition with Concept).
	2 <sup>nd</sup>	Laws of Limiting Friction (Only statement, No Experimental Verification).
	3 <sup>rd</sup>	Coefficient of Friction – Definition & Formula, Simple Numericals. Methods to reduce friction.
	4 <sup>th</sup>	Newton's Laws of Gravitation – Statement and Explanation.

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6 <sup>th</sup>	1 <sup>st</sup>	Universal Gravitational Constant (G)- Definition, Unit and Dimension.
	2 <sup>nd</sup>	Acceleration due to gravity (g)- Definition and Concept.
	3 <sup>rd</sup>	Definition of mass and weight.Relation between g and G.
	4 <sup>th</sup>	Variation of g with altitude and depth (No derivation – Only Explanation).Kepler’s Laws of Planetary Motion (Statement only).
7 <sup>th</sup>	1 <sup>st</sup>	Simple Harmonic Motion (SHM) - Definition & Examples.
	2 <sup>nd</sup>	Expression (Formula/Equation) for displacement, velocity, acceleration of a body/ particle in SHM.
	3 <sup>rd</sup>	Wave motion – Definition & Concept.Transverse and Longitudinal wave motion – Definition, Examples & Comparison.
	4 <sup>th</sup>	Definition of different wave parameters (Amplitude, Wavelength, Frequency, Time Period.
8 <sup>th</sup>	1 <sup>st</sup>	Derivation of Relation between Velocity, Frequency and Wavelength of a wave
	2 <sup>nd</sup>	Ultrasonics – Definition, Properties & Applications.
	3 <sup>rd</sup>	Heat and Temperature – Definition & Difference
	4 <sup>th</sup>	Units of Heat (FPS, CGS, MKS & SI).
9 <sup>th</sup>	1 <sup>st</sup>	Specific Heat (concept, definition, unit, dimension and simple numerical)
	2 <sup>nd</sup>	Change of state (concept), Latent Heat (concept, definition, unit, dimension and simple numerical)
	3 <sup>rd</sup>	Thermal Expansion – Definition & Concept,Expansion of Solids (Concept)
	4 <sup>th</sup>	Coefficient of linear, superficial and cubical expansions of Solids – Definition & Units.Relation between $\alpha$ , $\beta$ & $\gamma$

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10 <sup>th</sup>	1 <sup>st</sup>	Work and Heat - Concept & Relation.Joule's Mechanical Equivalent of Heat (Definition, Unit),First Law of Thermodynamics (Statement and concept only)
	2 <sup>nd</sup>	Reflection & Refraction – Definition.Laws of reflection and refraction (Statement only)
	3 <sup>rd</sup>	Refractive index – Definition, Formula & Simple numerical.
	4 <sup>th</sup>	Critical Angle and Total internal reflection – Concept, Definition & Explanation,
11 <sup>th</sup>	1 <sup>st</sup>	Refraction through Prism (Ray Diagram & Formula only – NO derivation)..
	2 <sup>nd</sup>	Fiber Optics – Definition, Properties & Applications.
	3 <sup>rd</sup>	Electrostatics – Definition & Concept.
	4 <sup>th</sup>	Statement & Explanation of Coulombs laws, Definition of Unit charge.Absolute & Relative Permittivity ( $\epsilon$ ) – Definition, Relation & Unit
12 <sup>th</sup>	1 <sup>st</sup>	Electric potential and Electric Potential difference (Definition, Formula & SI Units).
	2 <sup>nd</sup>	Electric field, Electric field intensity (E) – Definition, Formula & Unit.
	3 <sup>rd</sup>	Capacitance - Definition, Formula & Unit.Series and Parallel combination of Capacitors (No derivation, Formula for effective/Combined/total capacitance & Simple numericals).
	4 <sup>th</sup>	Magnet, Properties of a magnet.Coulomb's Laws in Magnetism – Statement & Explanation, Unit Pol(Definition).
13 <sup>th</sup>	1 <sup>st</sup>	Magnetic field, Magnetic Field intensity (H) - (Definition, Formula & SI Unit).
	2 <sup>nd</sup>	Magnetic lines of force ( Definition and Properties),Magnetic Flux ( $\Phi$ ) & Magnetic Flux Density (B) – Definition, Formula & Unit.
	3 <sup>rd</sup>	Electric Current – Definition, Formula & SI Units.
	4 <sup>th</sup>	Ohm's law and its applications.
14 <sup>th</sup>	1 <sup>st</sup>	Series and Parallel combination of resistors (No derivation, Formula for effective/ Combined/ total resistance & Simple numericals).
	2 <sup>nd</sup>	Kirchhoff's laws (Statement & Explanation with diagram).
	3 <sup>rd</sup>	Application of Kirchhoff's laws to Wheatstone bridge - Balanced condition of Wheatstone's Bridge – Condition of Balance (Equation).
	4 <sup>th</sup>	Electromagnetism – Definition & Concept.
15 <sup>th</sup>	1 <sup>st</sup>	Force acting on a current carrying conductor placed in a uniform magnetic field, Fleming's Left Hand Rule
	2 <sup>nd</sup>	Faraday's Laws of Electromagnetic Induction (Statement only)
	3 <sup>rd</sup>	Lenz's Law (Statement)
	4 <sup>th</sup>	Fleming's Right Hand Rule,Comparison between Fleming's Right Hand Rule and Fleming's Left Hand Rule.
16 <sup>th</sup>	1 <sup>st</sup>	LASER & laser beam (Concept and Definition)
	2 <sup>nd</sup>	Principle of LASER (Population Inversion & Optical Pumping)
	3 <sup>rd</sup>	Properties & Applications of LASER
	4 <sup>th</sup>	Wireless Transmission – Ground Waves, Sky Waves, Space Waves ( Concept & Definition)