

ACADEMIC PLAN

DEPARTMENT: MATHEMATICS AND SCIENCE,
BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

ACADEMIC SESSION:-2021-22

SEMESTER: - 1ST SEM

SUBJECT: - PHYSICS

SECTION: - B BRANCH:- CIVIL

Discipline: (CIVIL)	Semester: 1 st Semester	Name of the Teaching Faculty:
В		Dr.Biswamber Mohanty
		Pradosh Kumar Gajendra
Subject: ENGG	No. of Days/	Semester From: - Date: 25 / 10 / 2021 to 31/01/2022
PHYSICS	per week class allotted (Mon,Thurs,Fri,Sat)	No of Weeks: - 15
Week	Class days & Dates	Theory Topics
	25 40 24	
1	25.10.21	UNIT 1 - UNITS AND DIMENSIONS
	28.10.21	 1.1 Physical quantities - (Definition) 1.2 Definition of fundamental and derived units, systems of units (FPS, CGS, MKS and SI units). 1.3 Definition of dimension and Dimensional formulae of physical
	29.10.21	quantities. 1.4 Dimensional equations and Principle of homogeneity. 1.5 Checking the dimensional correctness of Physical relations.
	30.10.21	
2	1.11.21	UNIT 2 - SCALARS AND VECTORS
	4.11.21	2.1 Scalar and Vector quantities (definition and concept), Representation of a Vector – examples, types of vectors.
	5.11.21	2.2 Triangle and Parallelogram law of vector Addition (Statement only). Simple Numerical.2.3 Resolution of Vectors – Simple Numerical on Horizontal and
	6.11.21	Vertical components. 2.4 Vector multiplication (scalar product and vector product of vectors).
	8.11.21	UNIT 3 – KINEMATICS
	0.11.21	3.1 Concept of Rest and Motion.
3	11.11.21	3.2 Displacement, Speed, Velocity, Acceleration & FORCE
	12.11.21	(Definition, formula, dimension & SI units). 3.3 Equations of Motion under Gravity (upward and downward motion) - no derivation.
	13.11.21	3.4 Circular motion: Angular displacement, Angular velocity and Angular acceleration (definition, formula & SI units).

4	15.11.21	UNIT 3 – KINEMATICS
	18.11.21	3.5 Relation between –(i) Linear & Angular velocity, (ii) Linear &
	10.11.21	Angular acceleration).
	20.11.21	3.6 Define Projectile, Examples of Projectile.3.7 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
5	22.11.21	UNIT 4 – WORK AND FRICTION
		4.1 Work – Definition, Formula & SI units.
	25.11.21	4.2 Friction – Definition & Concept.
	26.11.21	4.3 Types of friction (static, dynamic), Limiting Friction (Definition
	20.11.21	with Concept)
	27.11.21	4.4 Laws of Limiting Friction (Only statement, No Experimental
		Verification).
		4.5 Coefficient of Friction – Definition & Formula, Simple
		Numericals
		4.6 Methods to reduce friction
6	29.11.21	UNIT 5 – GRAVITATION
	244.24	5.1 Newton's Laws of Gravitation – Statement and Explanation.
	2.11.21	5.2 Universal Gravitational Constant (G)- Definition, Unit and
	3.12.21	Dimension.
	3.12.21	5.3 Acceleration due to gravity (g)- Definition and Concept.
	4.12.21	5.4 Definition of mass and weight.
		5.5 Relation between g and G.
		5.6 Variation of g with altitude and depth (No derivation – Only Explanation).
		5.7 Kepler's Laws of Planetary Motion (Statement only).
		3.7 Repier 3 Edws of Fidirectary Motion (Statement only).
7	6.12.21	UNIT 6 - OSCILLATIONS AND WAVES
		6.1 Simple Harmonic Motion (SHM) - Definition & Examples.
		6.2 Expression (Formula/Equation) for displacement, velocity,
	9.12.21	acceleration of a body/ particle in SHM
	3.12.21	6.3. Wave motion – Definition & Concept.
		6.4 Transverse and Longitudinal wave motion – Definition,
		Examples & Comparison.
	10.12.21	6.5 Definition of different wave parameters (Amplitude,
		Wavelength, Frequency, Time Period. 6.6 Derivation of Relation between Velocity, Frequency and
		Wavelength of a wave
	11.12.21	6.7 Ultrasonics – Definition, Properties & Applications
		3.7 Octavolities Definition, Properties & Applications
8	13.12.21	UNIT 7 - HEAT AND THERMODYNAMICS
		7.1 Heat and Temperature – Definition & Difference
		7.2 Units of Heat (FPS, CGS, MKS & SI).
	45.24.25	7.3 Specific Heat (concept, definition, unit, dimension and simple
	16.21.21	numerical)

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Formula & Unit.	
	etic lines of force (Definition and Properties) etic Flux (Φ) & Magnetic Flux Density (Β) – Definition,

13	17.1.22	UNIT 10 – CURRENT ELECTRICITY
	20.1.21	10.1 Electric Current – Definition, Formula & SI Units. 10.2 Ohm's law and its applications.
	21.1.22	10.3 Series and Parallel combination of resistors (No derivation, Formula for effective/ Combined/ total resistance & Simple
	22.1.22	numerical). 10.4 Kirchhoff's laws (Statement & Explanation with diagram). 10.5 Application of Kirchhoff's laws to Wheatstone bridge - Balanced condition of Wheatstone's Bridge – Condition of Balance (Equation).
14	24.1.22	UNIT 11 – ELECTROMAGNETISM & ELECTROMAGNETIC
	27.1.22	INDUCTION 11.1 Electromagnetism – Definition & Concept. 11.2 Force acting
	28.1.22	on a current carrying conductor placed in a uniform magnetic field, Fleming's Left Hand Rule
	29.1.22	11.3 Faraday's Laws of Electromagnetic Induction (Statement only)
		11.4 Lenz's Law (Statement)
		11.5 Fleming's Right Hand Rule 11.6 Comparison between Fleming's Right Hand Rule and Fleming's Left Hand Rule.
15	31.1.22	UNIT 12 - MODERN PHYSICS 12.1 LASER & laser beam (Concept and Definition) 12.2 Principle of LASER (Population Inversion & Optical Pumping) 12.3 Properties & Applications of LASER
		12.4 Wireless Transmission – Ground Waves, Sky Waves, Space Waves