

K.T.S.P. Mandal's
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
Tal-Khed, Dist-Pune 410 505
DEPARTMENT OF PHYSICS
Syllabus Completion Report
Academic Year-2022-2023
Sem- I
F.Y.B.Sc. CBCS Pattern

Name: Mr. Barne N.D. PHY-111 Mechanics and Properties of Matter

Sr. No.	Months	Topics	Lectures
01	20 Aug. 2022 - 15 Sept. 2022	1. Motion: Introduction to motion, Types of motion, Displacement, Velocity, Acceleration, Inertia, Newton's laws of motion with their explanations, Various types of forces in nature, Frames of reference (Inertial and Non inertial), Laws of motion and it's real life applications, Problems	09
02	22 Sept.2022 - 07Oct. 2022	2. Work and Energy: Kinetic energy, Work Energy Theorem, Work done with constant force, Work done with varying force (spring force), Conservative and Non conservative forces, Potential energy, Law of energy conservation, Gravitational potential energy, Problems	07
03	13 Oct. 2022 - 03Nov. 2022	3. Fluid Mechanics: Concept of viscous force and viscosity, Coefficient of viscosity, Steady and Turbulent flow, Reynolds number, Equation of continuity, Bernoulli's Principle, Applications of Bernoulli's Principle (Ventury Meter, PitotTube), Applications of viscous fluids, Problems.	08
04	04 Nov.2022 - 24 Nov. 2022	4. Properties of Matter: Surface tension, Angle of contact, Factors affecting surface tension, Jaeger's method for determination of surface tension, Applications of surface tension. Stress and Strain, Hook's law and Coefficient of elasticity, Young's modulus, Bulk modulus, Modulus of rigidity, Work done during longitudinal strain, Volume strain, Shearing strain.	12
	09 Nov. 2022	Internal Exam	

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Academic Year-2022-2023
Sem- V
T.Y.B.Sc.

Name: Mr. Barne N.D.

Subject: PH-352 Electrodynamics

Months	Topics	Lectures
13 Sept. 2022- 02 Nov. 2022	1. Electrostatics: 1.1. Coulomb's law, Gauss law, Electric field, Electrostatic Potential 1.2. Potential energy of system of charges. 1.3. Statement of Poisson's equation, Boundary Value problems in electrostatics-solution of Laplace equation in Cartesian system, 1.4. Method of image charges: Point charge near an infinite grounded conducting plane, Point charge near grounded conducting sphere. 1.5. Polarization P, Electric displacement D, Electric susceptibility and dielectric constant, bound volume and surface charge densities. 1.6. Electric field at an exterior and interior point of dielectric.	12
07 Nov. 2022- 23 Nov. 2022	2.Magnetostatics: 2.1. Concepts of magnetic induction, magnetic flux and magnetic field 2.2. Magnetic induction due to straight current carrying conductor, Energy density in magnetic field, magnetization of matter. Relationship between B,H and M. 2.3 Biot-Savart's law, Ampere's law for force between two current carrying loops, Ampere's circuital law, 2.4 Equation of continuity, Magnetic vector potential A. 2.5. Magnetic susceptibility and permeability, Hysteresis loss, B-H curve.	12
28 Nov. 2023 to 31 Dec.	3. Electrodynamics: 3.1. Concept of electromagnetic induction, Faradays law of induction, Lenz's law, displacement current,	12

2023	generalization of Amperes' law 3.2. Maxwell's equations (Differential and Integral form) and their physical significance 3.3. Polarization, reflection & refraction of electromagnetic waves through media 3.4. Wave equation and plane waves in free space. 3.5. Poynting theorem & Poynting vector, Polarizations of plane wave. 3.6. Microscopic form of ohm's law ($J = \sigma \cdot E$)	
09 Nov. 2022	Internal Exam	

Mr. Barne N. D.

Date: 24/11/2022

To,
The Principal,
Hutatma Rajguru Mahavidyalaya,
Rajgurunagar.

Subject:-Submission of syllabus completion report for academic year-
2022-2023

Reference: - Your notice on staff notice board.

Respected Sir,

Here I submitted syllabus completion report for academic year 2022-
2023.

In this academic year theory workload is 06 lectures and 12 lectures for practical
and 04 lectures for project. I taught the following paper in this term

Sr. No.	Class	Name of Paper	No. of lectures allotted per week
1	F.Y.B.Sc.	Physics Paper I PHY121	03
2	T.Y.B.Sc.	PHY352 Electrodynamics	03
3	F.Y.B.Sc.	Practical	12
4	T.Y.B.Sc.	Projects	04

Thanking You,

Mr. Barne N. D.

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2022-2023

DEPARTMENT OF PHYSICS

SEM VI

T.Y.B.Sc.

Name: Mr. Barne N.D.

PHY-365 (A): Electronics-II

Months	Topic taken	Periods
13 Feb.2023 - 14 March 2023	1: Semiconductor Devices: a. LED and Photodiode, Optocoupler. (Working Principles) Problems. Ref. 1. b. BJT: Transistor amplifier classifications - Class A, B, C and AB (working only), Differential amplifier (transistorized), Problems. Ref. 1. c. Field Effect Transistor: JFET (Introduction, classification, principle, working and IV characteristics) MOSFETs (DE-MOSFET and E only MOSFET). Problems.	09
15 March 2023 - 5 March 2023	2: Applications of Semiconductor Devices: a. Three Pin Regulators: Block diagram of 3-pin IC regulator, study of IC-78XX, 79XX. Dual Power Supply using IC-78XX, 79XX. Ref. 1 b. Switching Regulators (SMPS): Introduction, Block diagram, Advantages and Disadvantages. Ref. 4 c. Modulation and Demodulation : Concept of Carrier Wave, Need of Modulation and Demodulation, Methods of Modulation like AM, FM, PM (Concepts Only), d. Concept of Modulation Index, Upper and Lower Side Band Frequencies in AM. Problems	09
10 Apr. 2023 - 18 Apr.2023	3: Integrated Circuits: a. Integrated Circuits: Introduction, Scale of Integration, Advantages and drawbacks of IC Ref.4 b. OP-AMP Applications as Integrator, Differentiator, Comparator.	09

	Ref. 1 c. Timer IC-555: Block diagram, Astable, monostable multivibrator (working and design). Problems	
04 May 2023	INTERNAL EXAM	
19 Apr.2023 - 26 April 2023	<p>4: Combinational and Sequential Circuits:</p> <p>a. Combinational Circuits: Introduction to SOP and POS equation. Concept of Standard SOP and POS equation. Concept of K-map and their use in reduction of Boolean expressions, design of half adder, full adder, half subtract, Study of binary to gray and gray to binary code conversion. Problems. Ref. 2</p> <p>b. Sequential Circuits: RS flip flop using NAND/NOR, clocked RS, D, JK and T-flip flops. Application of flip flops in Sequential Circuits as Counters and Registers. Asynchronous and Synchronous Counters. (3-bit Counter), Shift Registers and their types of operation -SISO, SIPO, PISO, PIPO (Concepts only).</p>	09

Mr. Barne N. D.

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2022-2023

DEPARTMENT OF PHYSICS

SEM II

F.Y.B.Sc.

Name: Mr. Barne N.D.

PHY-121 Heat and Thermodynamics

Months	Topic taken	Periods
13 Apr. 2023 - 29 Apr. 2023	1. Fundamentals of Thermodynamics Concept of thermodynamic state, Equation of state, Van der Waal's equation of state, Thermal equilibrium, Zeroth law of thermodynamics, Thermodynamic processes: Adiabatic, Isothermal, Isobaric and Isochoric changes, Indicator diagram, Work done during isothermal change, Adiabatic relations, Work done during adiabatic change, Internal energy, Internal energy as state function, First law of thermodynamics, Reversible and Irreversible changes, Problems.	10
01 May 2023 – 04 May 2023	2. Applied Thermodynamics Conversion of heat into work and it's converse, Second law of thermodynamics, Concept of entropy, Temperature - entropy diagram, T-dS equations, Clausius - Clapeyron latent heat equations, Problems.	09
07 May 2023	3. Heat Transfer Mechanisms Carnot's cycle and Carnot's heat engine and its efficiency, Heat Engines: Otto cycle & its efficiency, Diesel cycle & its efficiency, Refrigerators: General principle and coefficient of performance of refrigerator, Simple structure of Vapor compression refrigerator, Air Conditioning: Principle and it's applications, Problems	09
02 May 2023	INTERNAL EXAM	

23 March 2023 - 08 Apr. 2023	4. Thermometry Concept of heat & temperature, Principle of thermometry, Temperature scales & inter-conversions, Principle, Construction and Working: (Liquid thermometers, Liquid filled thermometers, Gas filled thermometers, Bimetallic thermometers, Platinum resistance thermometer, Thermocouple), Problems	08
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Mr. Barne N. D.

Date: 12/05/2023

To,
The Principal,
Hutatma Rajguru Mahavidyalaya,
Rajgurunagar.

Subject:-Submission of syllabus completion report for academic year-2022-2023(Term-II)....

Reference: - Your notice on staff notice board.

Respected Sir,

Here I submitted syllabus completion report for academic year 2022-2023.

In this academic year theory workload is 06 lectures and 12 lectures for practical and 04 lectures for project. I taught the following paper in this term II.

Sr. No.	Class	Name of Paper	No. of lectures allotted per week
1	F.Y.B.Sc.	Physics Paper I PHY121	03
2	T.Y.B.Sc.	PHY365 A Electronics-II	03
3	F.Y.B.Sc.	Practical	12
4	T.Y.B.Sc.	Projects	04

Thanking You,

Mr. Barne N. D.