



**SECOND-YEAR OF BACHELOR OF SCIENCE
Physics (MAJOR AND MINOR) REVISED
SYLLABUS ACCORDING TO CBCS NEP2020**

**COURSE TITLE: Physics-I
SEMESTER-IV
W.E.F. 2024-2025**

**RECOMMENDED BY THE BOARD OF STUDIES IN PHYSICS
AND
APPROVED BY THE ACADEMIC COUNCIL**

Devrukh Shikshan Prasarak Mandal's

Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and
Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh.
Tal. Sangameshwar, Dist. Ratnagiri-415804, Maharashtra,
India

Academic Council Item No:

Name of the Implementing Institute	:	Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangameshwar, Dist. Ratnagiri-415804,
Name of the Parent University	:	University of Mumbai
Name of the Programme	:	Bachelor of Science
Name of the Department	:	Physics
Name of the Class	:	Second Year
Semester	:	Fourth
No. of Credits	:	02
Title of the Course	:	Physics-I
Course Code	:	S207PHT
Name of the Vertical in adherence to NEP 2020	:	Major and Minor
Eligibility for Admission	:	Any student admitted to Second Year of B.Sc. Degree Programme in adherence to Rules and Regulations of the University of Mumbai and Government of Maharashtra
Passing Marks	:	40%
Mode of Assessment	:	Formative and Summative
Level	:	UG
Pattern of Marks Distribution for SEE and CIA	:	40:60
Status	:	NEP-CBCS
To be implemented from Academic Year	:	2024-2025
Ordinances /Regulations (if any)		

Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce and Vid. Dadasaheb Pitre Science College, Devrukh (An Autonomous College Affiliated with University of Mumbai)

Syllabus for Second Year of Bachelor of Science in Physics

(With effect from the academic year 2024-2025)

SEMESTER-IV

Paper No.– 1

Course Title: Physics-I

No. of Credits - 02

Type of Vertical: Major and Minor

COURSE CODE: S207PHT

Learning Outcomes Based on BLOOM's Taxonomy:

After completing the course, the learner will be able to...		
Course Learning Outcome No.	Blooms Taxonomy	Course Learning Outcome
CLO-01	Remember	Apply the mathematical methods to differential equations, scalar/vector functions
CLO-02	Understand	Do the arithmetic operation binary number and design the circuit using logic gates for Flip-Flop
CLO-03	Apply	Describe the concept of both types of Resolving Power
CLO-04	Analyze	Explain the concept of Entropy and its importance, entropy change in various processes and principle of increase of entropy
CLO-05	Evaluate	Solve numerical examples related to the content

Syllabus for Second Year of Bachelor of Science in Physics**(With effect from the academic year 2024-2025)****SEMESTER-IV****Paper No.– 1****Course Title: Physics-I****No. of Credits - 02****Type of Vertical: Major and Minor****COURSE CODE: S207PHT**

COURSE CONTENT			
Module No.	Content	Credits	No. of Hours
I	Curvilinear Coordinates and Electrodynamics Cylindrical Coordinates, Spherical Coordinates Product rules and second derivatives involving the ∇ operator, Line, Surface and Volume Integrals, The Fundamental Theorems of Gradient, Divergence and Curl. DG: 1.4.1, 1.4.2, 1.2.6, 1.2.7, 1.3.1 to 1	01	15
	Differential equation Theory of transformer, Transistor biasing, inherent variations of transistor parameters, stabilization, essentials of a transistor biasing circuit, methods of transistor biasing, base resistor method, emitter bias circuit, circuit analysis of emitter bias. CH: 5.2.1 to 5.2.3		
	Sinusoidal Oscillators and Flip Flops Introduction, effect of positive feedback. Requirements for sustained oscillations JH: 15.1, 15.4, 15.8 RS Flip-Flops, only NOR gate latch, NAND gate latch, Gated Flip-Flops, Edge-Triggered RS Flip-Flop, Edge-Triggered D Flip-Flop, Edge-Triggered J-K Flip-Flop, JK Master-Slave Flip-Flops, Bounce elimination switch. WG: 7.1 to 7.5		
II	Resolving Power Concept of resolution of two objects and two closely spaced wavelengths, limiting angle of resolution and resolving power, Concept of Chromatic Resolving power, Rayleigh's criterion, resolving power of optical instruments) Formulae only - (telescope, prism, plane transmission grating. BSA: 19.1, 9.2, 19.5 to 19.7, 19.11, 19.12	01	15
	Entropy Clausius' theorem, Entropy, Entropy of a cyclic process, Reversible process, Entropy change, Reversible heat transfer, Principle of increase in entropy, entropy of steam, entropy and unavailable energy, entropy and disorder, absolute entropy. BSH: 5.1 to 5.5, 5.7 to 5.11		
Total		02	30

Access to the Course

The course is available for all the students admitted for Second Year Bachelor of Science.

Methods of Assessment

The assessment pattern would be 40:60, 60% for Semester End Examination (SEE) and 40% for Continuous Internal Assessment (CIA). The structure of the SEE and CIA would be as recommended by the Board of Studies and approved by the Board of Examination and the Academic Council of the college.

References :

1. **DG:** Introduction to Electrodynamics, David J. Griffiths (3rd Ed) Prentice Hall of India
2. **CH:** Charlie Harper, Introduction to Mathematical Physics , 2009 (EEE) PHI Learning Pvt. Ltd.
3. **JH:** Electronic Device Circuits, Jacob Miliman and Hawkins.
4. **WG:** Digital Electronics – Introduction to Theory and Practical
5. A Text Book Of Optics By: Dr. N. Subrahmanyam, Brijlal, Dr M.N. Avadhaanulu (S. Chand, 25th Revised edition 2012 Reprint 2013) .
6. **BSH:** Heat thermodynamics and Statistical Physics, Brijlal, N. Subramanyam, P. S. Hemne, S. Chand, edition 2007 .
7. Thermal Physics, AB Gupta and H. /Roy, Book and Allied (P) Ltd, Reprint 2008, 2009 .
8. LMS – Digital Principles and AplicationsBy Leach, Malvino, Saha 6thedn .
9. RPJ – Modern Digital Electronics by R P Jain 4thedn . (Additional Reading)