



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

**COURSE TITLE: Physics-II
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-II
Course Code	:	S208PHT
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-II

No. of Credits - 02

Type of Vertical: Major and Minor

COURSE CODE: S208PHT

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	Understand the basics of crystallography
CLO-02	Understand	Understand applications of Schrodinger' s equation
CLO-03	Apply	Study the behavior of particle under different potentials
CLO-04	Analyze	Apply the technique of separation of variables to solve problems in more than one dimension
CLO-05	Evaluate	To demonstrate quantitative problem solving skills in all the topics covered

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-II****No. of Credits - 02****Type of Vertical: Major and Minor****COURSE CODE: S208PHT**

COURSE CONTENT			
Module No.	Content	Credits	No. of Hours
I	<p>Crystallography The crystalline state –Crystalline and amorphous solids , Basic definitions of crystal lattice, basis vectors, unit cell, primitive and non-primitive cells, The fourteen Bravais lattices and the seven crystal systems, concept of symmetry and elements of symmetry for Simple cubic structure, nomenclature of crystal directions and crystal planes, Miller Indices, spacing between the planes of the same Miller indices, cubic crystal structures –Simple cubic structure, Body centred cubic structure, face centred cubic structure . . Some Crystal structures – Hexagonal closed packed structure . NaCl ,CsCl . Problems on Miller indices, Crystal direction, inter planer spacing . AKS – 1.1,1.2 SOP – I to VII ,XIV to XXII</p>	01	15
II	<p>Applications of Schrodinger equation –I Free particle, Particle in infinitely deep potential well) one – dimension (, Particle in finitely deep potential well) one – dimension (, Particle in two /three dimension rigid box, degeneracy of energy state RBS – 4.3, 6.1 to 6.4 RK – 8.2,8.4,8.5</p> <p>Applications of Schrodinger equation –II Step potential, Potential barrier) Finite height and width (penetration and tunneling effect) derivation of approximate transmission probability (, Theory of alpha particle decay from radioactive nucleus, Harmonic oscillator) one–dimension (, correspondence principle . RBS – 4.1,4.2,4.4,7.1</p>	01	15
	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. **AKS** - Solid state physic -Ajay Kumar Saxena - McMillan India ltd
2. **SOP** - Solid state physics - S.O.Pillai - New age international publishers 6th edition
3. **RBS** - Introduction to Modern Physics (volume - 1) R.B.Singh -New age international publishers
4. **RK** - Modern physics - R. Murugesan and ,Kiruthiga Sivaprasath -S Chand.
5. **GL** - Quantum Mechanics. - By Ghatak and Lokanathan Published by Mc. Millan.
6. **AB** - Concepts of Modern Physics – A. Beiser (6th Ed.) Tata McGraw Hill.