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

COURSE TITLE: **Physics-II**

SEMESTER-III

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	:	Third
No. of Credits	:	02
Title of the Course	:	Physics-II
Course Code	:	S202PHT
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)		

Syllabus for Second Year of Bachelor of Science in Physics

(With effect from the academic year 2024-2025)

SEMESTER-III **Paper No.– 1**

Course Title: Physics-II **No. of Credits - 02**

Type of Vertical: Major and Minor **COURSE CODE: S202PHT**

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	Learn about damped vibration and will solve mathematical derivations related to it .
CLO-02	Understand	Learn different transistor biasing methods .
CLO-03	Apply	Apply the principal and working of Transformer
CLO-04	Analyze	Enable to get familiar with central concepts of quantum mechanics : wave functions, momentum and energy operator, the Schrodinger equation, probability density and the normalization techniques, skill
CLO-05	Evaluate	Describe the effect of electric and magnetic field on motion of charged particles .

Syllabus for Second Year of Bachelor of Science in Physics

(With effect from the academic year 2024-2025)

SEMESTER-III **Paper No.– 1**

Course Title: Physics-II **No. of Credits - 02**

Type of Vertical: Major and Minor **COURSE CODE: S202PHT**

COURSE CONTENT			
Module No.	**Content**	**Credits**	**No. of Hours**
I	**Damped Vibrations** Decay of free vibrations of a simple harmonic oscillator due to the damping force proportional to the first power of velocity, types of damping, Energy of a damped oscillator Forced vibration and resonance : Forced damped harmonic oscillator, special cases : low driving frequency, high driving frequency. **HP – 9.3,9.4,9.6,9.7** **Transistor and Transformer** 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. **VKM – Chapter -9**	**01**	**15**
II	**Quantum Mechanics** Concept of wave function, Born interpretation of wave function, concepts of operator in quantum mechanics examples −position, momentum and energy operators, eigenvalue equations, expectation values of operators, schrodinger equation, postulates of Quantum Mechanics, analogy between wave equation and schrodinger equation, time dependent and time independent) steady state (Schrodinger equation, stationary states **AB – 5.1 ,5.2,5.3,5.5,5.6,5.7 RK – 10.1** **Charged particle dynamics** Force on charged particle in electric and magnetic field, equation of motion, motion of a charged particle in a constant and uniform electric field, Charged particle in a uniform and constant magnetic field . Motion of a charged particle in parallel electric and magnetic fields, helical motion and pitch, Velocity selector, cyclotron . **HP – 13.1 to 3.6 (except 13.5.2) BSJ – 9.11**	**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. **RH** - Resnick and Halliday : Physics – I
2. **HP** - Mechanics – H. S. Hans and S. P. Puri, Tata McGraw Hill (2nd ED.)
3. **VKM -** Principle of electronics – V.K. Mehta and Rohit Mehta – S. Chand
4. **AB** - Concepts of Modern Physics – A. Beiser (6th Ed.) Tata McGraw Hill.
5. **BSJ -** Mechanics and Electrodynamics Rev Edn. 2005 by Brijlal and Subramanyan and Jeevan Seshan
6. **RK** - Modern physics - R Murugeshan and Kiruthiga Sivaprasath - S Chand.
7. **RBS -** Introduction to Modern Physics (volume - 1) R.B.Singh - New age international publishers