FIRST-YEAR OF BACHELOR OF SCIENCE MAJOR PHYSICS REVISED SYLLABUS ACCORDING TO CBCS NEP2020

COURSE TITLE: ELECTRICITY & MAGNETISM, ELECTRONICS & MODERN PHYSICS
SEMESTER-I
W.E.F. 2023-2024

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.Sangmeshwar, Dist. Ratnagiri-415804, Maharashtra, India

Academic Council Item No: **03 dated 8 July 2023**

Name of the Implementing Institute	:	Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangmeshwar, 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	:	First Year
Semester	:	First
Paper	:	II
No. of Credits	:	02
Title of the Course	:	Electricity & Magnetism, Electronics & Modern Physics
Course Code	:	S102PHT
Name of the Vertical in adherence to NEP 2020	:	Major and Minor
Eligibility for Admission	:	Any 12^{th} Pass seeking Admission to 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	:	60:40
Status	:	NEP-CBCS
To be implemented from Academic Year	:	2023-2024
Ordinances /Regulations (if any)		

Syllabus for First Year of Bachelor of Science in Physics
(With effect from the academic year 2023-2024)

SEMESTER-I **Paper No.– Physics Paper – II**
Course Title: Electricity & Magnetism, Electronics & Modern physics **No. of Credits – 02**
Type of Vertical: Major and Minor **COURSE CODE: S102PHT**

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	Define basic concepts in electricity, magnetism, digital electronics and modern physics
CLO-02	Understand	Understand the number systems and inter-conversions
CLO-03	Understand	Understand the basic concepts in electro/magnetostatics
CLO-04	Apply	Solve the problems based on electro/magneto statics
CLO-05	Analyze	Explain the importance of Rutherford experiment & concept of atom
CLO-06	Analyze	Explain the basic concepts in modern physics

Syllabus for First Year of Bachelor of Science in Physics
(With effect from the academic year 2023-2024)

SEMESTER-I **Paper No.– Physics Paper – II**

Course Title: Electricity & Magnetism, Electronics & Modern physics **No. of Credits – 02**

Type of Vertical: Major and Minor **COURSE CODE: S102PHT**

COURSE CONTENT			
Module	**Content**	**Credits**	**No. of Lectures**
1	**1.** Electrostatics: Coulomb's Law, electric lines of force, Electric Field, Electric Potential, Energy stored in a discrete charge distribution, Problems based on discrete charge distribution. **2.** Magnetostatics: Biot-Savart's Law, magnetic lines of force, Lorentz force, motion of charge particle in magnetic field, applications Biot-Savart's Law–magnetic field near current carrying wire, magnetic field due to circular loop along its axis, problems based on Lorentz force and applications **3.** Digital electronics: Logic gates –AND,OR, NOT,NAND,NOR,EX-OR (logic expression, symbol, truth table) Binary, Decimal & Hexadecimal number system and inter-conversion, Binary addition/subtraction	**01**	**15**
2	**1.** Basic concepts –electron volt, energy/velocity gained by a charged particle accelerated by a PD, X-rays –production, X-ray spectrum, properties and Applications of X-Rays. **2.** Concept of photon, Definition work function, Threshold frequency and Threshold wavelength, photoelectric effect-Experimental arrangement, characteristics of photo-electric effect, Einstein photoelectric equation, problems based on Einstein photoelectric equation and work function. **3.** Rutherford experiment, concept of nucleus, isotope, isobar, isotone, atomic mass unit (amu), Basic properties of nuclei, Composition, Charge, Size, density of nucleus, Mass defect and Binding energy, Packing fraction. Concept of natural radioactivity, properties of α, β, γ-rays, law of radioactive decay, nuclear reactions.	**01**	**15**
	Total	**02**	**30**

References:

Unit-I

1. D. Chattopadhyay, P C Rakshit , Electricity and Magnetism 7th Ed. New Central Book agency
2. David J. Griffiths : Introduction to Electrodynamics, Prentice Hall India (EEE) 3rd Ed.
3. A P Malvino, Digital Principles and Applications: Tata McGraw Hill.
4. Tokhiem, Digital electronics, 4thed, McGraw Hill International Edition

Unit-II

1. N Subrahmanyam, Brijlal and Seshan, Atomic and Nuclear Physics Revised Ed. Reprint 2012, S. Chand
2. Arthur Beiser, Perspectives of Modern Physics : Tata McGraw Hill

Access to the Course

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

Methods of Assessment

The assessment pattern would be 60:40, 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.

Pattern of Evaluation

The Examination/Evaluation pattern shall be framed by the Board of Examination with its final approval from the Academic Council of the College.