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## REVISED SYLLABUS ACCORDING TO CBCS NEP2020 SECOND-YEAR OF MASTER OF SCIENCE IN PHYSICS

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**COURSE TITLE:- EXPERIMENTAL 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.Sangmeshwar, Dist. Ratnagiri-415804, Maharashtra, India

Academic Council Item No: **dated 19 April 2024**

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	:	Master of Science
Name of the Department	:	Physics
Name of the Class	:	Second Year
Semester	:	Forth
No. of Credits	:	02
Title of the Course	:	Experimental Physics - I
Course Code	:	S612PHT
Name of the Vertical in adherence to NEP 2020	:	Elective
Eligibility for Admission	:	Any student admitted to Second year of M.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	:	PG
Pattern of Marks Distribution for SEE and CIA	:	60:40
Status	:	NEP-CBCS
To be implemented from Academic Year	:	2024 - 2025

## Syllabus for First Year of Master of Science in Physics

(With effect from the academic year 2024 - 2025)

**SEMESTER - IV**

**Paper– Physics Paper – V**

**Course Title: Lab – Experimental Physics – I**

**No. of Credits - 02**

**Type of Vertical: Elective**

**COURSE CODE: S612PHT**

### 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	Understand	Understand the principles and applications of various vacuum techniques presented
CLO-02	Understand	Understand various nuclear detectors and their applications
CLO-03	Understand	Understand principles of working of various accelerators
CLO-04	Apply	Solve numerical problems related to the topics in the course

**Syllabus for First Year of Master of Science in Physics**  
(With effect from the academic year 2024 - 2025)

**SEMESTER - IV****Course Title: Lab – Experimental Physics - I****Type of Vertical: Elective****Paper No.–Physics Paper – V****No. of Credits - 02****COURSE CODE: S612PHT**

<b>COURSE CONTENT</b>			
<b>Module No.</b>	<b>Content</b>	<b>Credits</b>	<b>No. of Lectures</b>
<b>1</b>	<b>Vacuum Techniques:</b> Fundamental processes at low pressures, Mean Free Path, Time to form monolayer, Number density, Materials used at low pressures, vapour pressure Impingement rate, Flow of gases, Laminar and turbulent flow, Production of low pressures; High Vacuum Pumps and systems, Ultra High Vacuum Pumps and System, Measurement of pressure, Leak detections	<b>01</b>	<b>15</b>
<b>2</b>	<b>Nuclear Detectors:</b> Gamma ray spectrometer using NaI scintillation detector, High Purity Germanium detector, Multi-wire Proportional counter. <b>Accelerators:</b> Cockcroft Walten Generator, Van de Graff Generator, Sloan and Lawrence type Linear Accelerator, Proton Linear Accelerator, Cyclotron and Synchrotron.	<b>01</b>	<b>15</b>
Total		<b>02</b>	<b>30</b>

**Reference Books:-**

1. Vacuum Technology, A. Roth, North Holland Amsterdam
2. Ultra High Vacuum Techniques, D. K. Avasthi, A. Tripathi, A. C. Gupta, Allied Publishers Pvt. Ltd (2002)
3. Vacuum Science and Technology, V. V. Rao, T. B. Ghosh, K. L. Chopra, Allied Publishers Pvt. Ltd (2001)
4. Nuclei and Particles, E. Segre, W. A. Benjamin
4. Nuclear Radiation Detection- William James Price , McGraw Hill
5. Introduction to Nuclear Physics, HA Enge, pp 345-353
6. Radiation detection & Measurement-Glenn F. Knoll
7. Techniques for Nuclear & Particle Physics Experiment- William Leo

**Access to the Course**

The course is available for all the students admitted for Master of Science in Physics.

**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.

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