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

COURSE TITLE:- EXPERIMENTAL 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.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 - II
Course Code	:	S614PHT
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 – VI**

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

Type of Vertical: Elective **COURSE CODE: S614PHT**

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 basics of x-ray diffraction and role of reciprocal lattice and Brillouin Zones
CLO-02	Understand	Understand the relation of lattice vibration and thermal conductivity
CLO-03	Understand	Understand thermal and electrical properties in the free-electron model.
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 **Paper –Physics Paper – VI**
Course Title: Lab – Experimental Physics - II **No. of Credits - 02**
Type of Vertical: Elective **COURSE CODE: S614PHT**

COURSE CONTENT			
Module No.	**Content**	**Credits**	**No. of Lectures**
1	**Data Analysis for Physical Sciences:** Population and Sample, Data distributions Probability,Probability Distribution, Distribution of Real Data, The normal distribution, The normal distribution, From area under a normal curve to an interval, Distribution of sample means, The central limit theorem, The t distribution, The log-normal distribution, Assessing the normality of data, Population mean and continuous distributions, Population mean and expectation value, The binomial distribution The Poisson distribution, Experimental Error, Measurement, error and uncertainty, The process of measurement, True value and error, Precision and accuracy, Random and systematic errors, Random errors, Uncertainty in measurement.	**01**	**15**
2	**Characterization techniques for materials analysis:** **1.** Spectroscopy: XRD, XRF, XPS, EDAX, Raman, UV Visible spectroscopy, FTIR spectroscopy. **2.** Microscopy: SEM, TEM, AFM.	**01**	**15**
	Total	**02**	**30**

Reference Books:-

1. Data Analysis for Physical Sciences (Featuring Excel®) Les Kirkup, 2nd Edition, Cambridge University Press (2012), Chapters 1-6 and 9
2. Statistical Methods in Practice for scientists ad Technologists, Richard Boddy and Gordon Smith, John Wiley & Sons (2009)
3. An Introduction to Materials Characterization, Khangaonkar P. R., Penram International Publishing
4. Rutherford Backscattering Spectrometry, W. K. Chu, J. W. Mayer, M. A. Nicolet, Academic Press
5. A Guide to Materials Characterization and Chemical Analysis, John P. Sibilia, Wiley-VCH; 2 edition
6. Fundamentals of Surface and Thin Film Analysis, L.C. Feldman and J.W. Mayer North Holland Amsterdam
7. Elements of X-ray diffraction, Cullity, B. D Addison-Wesley Publishing Company, Inc.
8. Nano: The Essentials: T. Pradeep, TMH Publications

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.