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

COURSE TITLE:- ELECTIVE II (THEORY)
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	:	Master of Science
Name of the Department	:	Physics
Name of the Class	:	First Year
Semester	:	First
No. of Credits	:	02
Title of the Course	:	Magnetism
Course Code	:	S507PHT
Name of the Vertical in adherence to NEP 2020	:	Elective II
Eligibility for Admission	:	BSc in Physics
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	:	2023-2024

Syllabus for First Year of Master of Science in Physics

(With effect from the academic year 2023-2024)

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

Course Title: Magnetism **No. of Credits - 02**

Type of Vertical: Elective-II **COURSE CODE: S507PHT**

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 various magnetic phenomenon and their relation to atomic structures
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 2023-2024)

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

Course Title: Magnetism **No. of Credits - 02**

Type of Vertical: Elective-II **COURSE CODE: S507PHT**

COURSE CONTENT			
Module No.	**Content**	**Credits**	**No. of Lectures**
1	**Diamagnetism and Paramagnetism:** Langevin diamagnetic equation, diamagnetic response, Quantum mechanical formulation, core diamagnetism. Quantum Theory of Paramagnetism, Rare Earth Ions, Hund's Rule, Iron Group ions, Crystal Field Splitting and Quenching of orbital angular momentum; Adiabatic Demagnetisation of a paramagnetic Salt, Paramagnetic susceptibility of conduction electrons	**01**	**15**
2	**Magnetic Ordering:** Ferromagnetic order-Exchange Integral, Saturation magnetisation, Magnons, neutron magnetic scattering; Ferrimagnetic order, spinels, Yttrium Iron Garnets, Anti Ferromagnetic order. Ferromagnetic Domains – Anisotropy energy, origin of domains, transition region between domains, Bloch wall, Coercive force and hysteresis.	**01**	**15**
	Total	**02**	**30**

Reference Books:-

1. Charles Kittel "Introduction to Solid State Physics", 7th edition John Wiley & sons.
2. J. Richard Christman "Fundamentals of Solid State Physics" John Wiley & sons
3. M.A.Wahab "Solid State Physics –Structure and properties of Materials" Narosa -1999.
4. M. Ali Omar "Elementary Solid State Physics" Addison Wesley (LPE)
5. H.Ibach and H.Luth 3rd edition "Solid State Physics – An Introduction to Principles of Materials Science" Springer International Edition (2004)

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.