

5 Year Integrated B.Sc. and M.Sc.(Physics) Program

1
st YEAR FIRST
SEMESTER

Course Code: Course Title	Course Structure	Pre-Requisite						
IMSPH101 Mathematical Physics-I I.M.Sc. Semester-I	<table border="1"> <thead> <tr> <th>L</th> <th>T</th> <th>P</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>1</td> <td>0</td> </tr> </tbody> </table>	L	T	P	3	1	0	NIL
L	T	P						
3	1	0						

Course Objectives:

To impart knowledge about various mathematical tools employed to study physics problems.

Course Outcomes (COs):

1. Understand the fundamentals of vector algebra
2. Study basic concepts and applications of Laplace transforms
3. Solve differential equations of various types.
4. Describe special functions and their recurrence relations.
5. To identify various numerical methods for a variety of multidisciplinary applications

Course Code: Course Title	Course Structure	Pre-Requisite						
IMSPH 103 Introduction to Mechanics I.M.Sc. Semester-I	<table border="1"> <thead> <tr> <th>L</th> <th>T</th> <th>P</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>1</td> <td>0</td> </tr> </tbody> </table>	L	T	P	3	1	0	Physics and Mathematics courses offered by Central Board of Secondary Education at higher secondary level or equivalent.
L	T	P						
3	1	0						

Course Objectives: The objective of Introduction to Mechanics is a comprehensive study of the fundamental principles governing the motion of particles and selected topics from special theory of relativity. This course also aims to cultivate a deep understanding of inertial and non-inertial reference frames, encompassing conservation principles, rigid body dynamics, gravitational motion and mechanics of continuous media. Through lectures, demonstrations, and problem-solving sessions, students will develop analytical skills and problem-solving proficiency essential for physics and engineering disciplines.

Course Outcomes (COs): By the end of this course, students should be able to:

1. Understand fundamental principles of classical mechanics.
2. Apply mathematical techniques to analyze motion and forces in inertial and non-inertial frames.
3. Solve problems involving rigid body dynamics and conservation laws.
4. Analyze gravitational motion and central force problems.
5. Comprehend the principles of mechanics in continuous media and special theory of relativity.

Course Code: Course Title	Course Structure	Pre-Requisite						
IMSPH 105 Elements of Electricity and Magnetism I.M.Sc. Semester-I	<table border="1"> <thead> <tr> <th>L</th> <th>T</th> <th>P</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>0</td> <td>2</td> </tr> </tbody> </table>	L	T	P	3	0	2	Class XII
L	T	P						
3	0	2						

Course Objectives:

This course builds on the fundamentals of electricity and magnetism. Students can understand the laws of electromagnetism from their everyday experience by specific examples of how electromagnetic phenomena occurs. Also, they will be able to represent these electromagnetic phenomena and fields mathematically.

Course Outcomes (COs)

1. Comprehend the fundamental laws of electrostatics and magnetostatics and study their application to systems of point charges/currents as well as line, surface, and volume distributions of charges. Also to use the knowledge to solve some simple problems
2. Evaluating electric fields and potentials with special techniques.
3. Understanding behaviour of electricity and magnetism inside matter.
4. Determine the magnetic force generated by a current carrying conductor
5. Have brief idea of magnetic materials, understand the concept of electromagnetic induction, solve problems using Faraday's and Lenz's laws

Course Code: Course Title	Course Structure	Pre-Requisite						
IMSPH 107 Physics I I.M.Sc. Semester-I	<table border="1"> <thead> <tr> <th>L</th> <th>T</th> <th>P</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>0</td> <td>2</td> </tr> </tbody> </table>	L	T	P	3	0	2	NIL
L	T	P						
3	0	2						

Course Objectives

This course typically aims to provide students with a foundational understanding of key physics concepts and principles. It is designed to develop analytical and problem-solving skills, as well as the ability to apply theoretical knowledge to practical situations.

Course Outcomes (COs)

1. To comprehend basic physics concepts such as kinematics, dynamics, energy, momentum, and rotational motion.
2. To apply the equations for relativistic momentum and energy, including the famous equation $E = mc^2$.
3. To solve a wide range of problems based on various optical phenomena using both theoretical and practical approaches.
4. To analyze the harmonic motion and thus solve the related problems.
5. To apply the wave equation to various physical contexts.