

Semester	JAN 2022
Open to semester	6,8,12,14,22
Course code	PH3253/PH6224
Course title	Group Theory in Physics
Credits	3 /4
Course Coordinator & participating faculty (if any)	Arun M. Thalapillil
Nature of Course	Lectures and Tutorials
Pre-requisites	Mathematical Methods for Physics (PH2123) or equivalent, Quantum Mechanics I (PH3124) or equivalent, Classical Mechanics (PH2213) or equivalent.
Objectives (goals, type of students for whom useful, outcome etc)	Symmetries play an important role in many branches of physics and furnishes very powerful methods to study various systems, without actually solving the corresponding equations in detail. This will be an introductory course on symmetries in physics, and the mathematical framework of groups. The course will aim to familiarise students with the mathematical aspects of groups and algebras, as applied to various areas in physics, like condensed matter physics, particle physics and general relativity.
Course contents (details of topics /sections with no. of lectures for each)	Abstract group theory, Theory of finite groups and representations, Discrete symmetries in physics, Theory of continuous groups and representations, Continuous symmetries in physics.
Evaluation /assessment	End-Sem Examination-50% Mid-Sem Examination-50% Others-%
Suggested readings (with full list of authors, publisher, year, edn etc.)	<ol style="list-style-type: none"> 1. Group Theory and Physics, S. Sternberg, Cambridge University Press; Revised ed. edition (7 September 1995). 2. Group Theory: A Physicist's Survey, P. Ramond, Cambridge University Press; 1st edition (13 May 2010). 3. Elements Of Group Theory For Physicists, A. W. Joshi, New Age International Publishers; Fifth edition (1 July 2018). 4. Lie Algebras in Particle Physics, H. Georgi, Westview Press; 1st edition (22 October 1999).