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| Semester | JAN 2022 |
| Open to semester | 8,14,22 |
| Course code | PHY422/PH6264 |
| Course title | Nuclear and Particle Physics |
| Credits | 4 /4 |
| Course Coordinator & participating faculty (if any) | Diptimoy Ghosh, Sourabh Dube* |
| Nature of Course | Lectures |
| Pre-requisites | Quantum Mechanics II (PHY 322); Classical Electrodynamics (PHY 312) |
| Objectives (goals, type of students for whom useful, outcome etc) | The course will focus on basic concepts in particle and nuclear physics, with introduction to experimental particle physics. The principal audience is intended to be advanced undergraduate and Ph.D/Ph.D students, seeking an introduction to the fundamental constituents of matter and their interactions. The course should serve as a fair prelude to an advanced course on the Standard Model of particle physics and gauge theories. However, the course is meant for all students of physics, not just those interested in a future in particle physics |
| Course contents (details of topics /sections with no. of lectures for each) | Historical introduction, Classification of fundamental particles, Relativistic kinematics, Interactions and particle dynamics, Symmetries and invariance principles, Feynman diagrams and calculations, KG/Dirac equation, overview of QED, Electroweak interactions and the Higgs mechanism, High energy physics experiments, Nuclear models. |
| Evaluation /assessment | End-Sem Examination-40% Mid-Sem Examination-40% Others-20% Quizzes% |
| Suggested readings (with full list of authors, publisher, year, edn etc.) | <ul style="list-style-type: none"> • Introduction to Elementary Particles, D. Griffiths (Wiley) • Particle Physics, B. R. Martin and G. Shaw (Wiley) • An Introduction to Nuclear Physics, W. M. Cottingham and D. A. Greenwood (Cambridge) |