

UNIVERSITY OF PUERTO RICO
RIO PIEDRAS CAMPUS
COLLEGE OF NATURAL SCIENCES
DEPARTMENT OF PHYSICS
UNDERGRADUATE PROGRAM

Title: Introduction to nuclear physics

Code: PHYS 4048

Number of Credits: 3

Prerequisites: PHYS 4046, 4032, and MATH 4031

Description

Introduction to the nuclear physics for physics majors. General description of the atomic nucleus. Relativistic dynamics. Experimental techniques. Radioactivity. Nuclear reactions. Nuclear forces, Nuclear structure models. Layer model. Scattering elementary theory. Reactors. High energy physics. Elementary particles and symmetry.

Objectives

After completing this course the student will be able to understand the atomic nucleus composition, the different theoretical models to describe nuclear behavior. To know the experimental techniques to study the nucleus and the applications as an energy source. The student will understand the relation between the nucleus composition and the high energy physics and elementary particles.

Course Content

Topic	Assigned time (hours)
1. Atomic nucleus: what is it and how to study it.	3
2. Atomic nucleus: what is it and how to study it.	3
3. General description of the nucleus.	3
4. General description of the nucleus.	3
5. Relativistic Dynamics.	3
6. Relativistic Dynamics.	3
7. Experimental techniques.	3
8. Experimental techniques.	3
9. Radiocativity	3
10. Radiocativity	3
11. Nuclear reactions and nuclear forces.	3
12. Nuclear reactions and nuclear forces.	3
13. Nuclear models and elementary scattering theory	3
14. Nuclear models and elementary scattering theory	3

15. Reactors and High energy physics.	3
Total hours	45 contact hours

Instructional Strategy

The main instructional tool in this class is lecturing.

Minimum Require Facilities

Traditional lecture room.

Student Evaluation

Two exams and homeworks.

Grading System

The overall score is determined by calculating the percentage of points obtained by the student. Grades are then assigned according to the standard curve: 100-90% = A, 89-80% = B, 79-70% = C, 69-60% = D, 59-0% = F.

Bibliography

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