

PHYS-206

Physics IV

Banerjee Mitali

Cursus	Sem.	Type
Physics	BA4	Obl.

Language of teaching	English
Credits	6
Session	Summer
Semester	Spring
Exam	Written
Workload	180h
Weeks	14
Hours	6 weekly
Courses	4 weekly
Exercises	2 weekly
Number of positions	

Summary

Wave physics, Introduction to quantum mechanics.

Content**Electromagnetism (2nd part)**

Electromagnetic induction and Faraday's law; Maxwell equations; electromagnetic energy, Poynting vector.

Wave physics

Mechanical and electromagnetic waves: propagation, energy and wave motion, attenuation, Doppler effect; principle of superposition of waves: standing waves, beats, interferences; interactions waves-medium: refraction, reflection, diffraction, diffusion.

Introduction to quantum mechanics

Limits of classical mechanics: black body radiation, the photoelectric effect, the Compton effect, Franck-Hertz experiment, spectroscopy. Wave-particle dual behavior, De Broglie waves: Heisenberg's uncertainty principle, wave function. Schrödinger's equation, 1D problems: particle in a box, potential wells and barriers, barrier tunneling. The hydrogen atom.

Learning Prerequisites**Required courses**

Physics I, II and III

Learning Outcomes

By the end of the course, the student must be able to:

- Elaborate a model of a physical phenomena
- Formulate hypotheses to simplify a model of a physical phenomena
- Solve the mathematics necessary to construct a model of a physical phenomena
- Critique the results of a model of a physical phenomena
- Apply models to solve problems and applications

Teaching methods

Ex cathedra and exercises in class

Assessment methods

Exercises every week will be graded and in the finals will carry maximum of 0.5 in the total credit of the course

Supervision

Office hours	No
Assistants	Yes
Forum	No
Others	No

Resources

Bibliography

Lectures notes and list of recommended books