A.S.	Classe	Disciplina	Docente
2024/2025	4aa	Fisica	Matteo Erba

Libri di testo

Physics for Cambridge IGCSE Coursebook
Sang D., Follows M., Tarpey S.
Cambridge University Press

Programma svolto

Programma Cambridge (in inglese)

Reflection of light. Plane mirrors. Refraction of light.
Internal reflection and total internal reflection.
Refractive index. Refraction equation. Optical fibers.
Converging thin lenses, image formation.
Dispersion of light.
Simple phenomena of magnetism. Forces between magnetic poles.
Induced magnetism. Magnetic field. Magnetic and nonmagnetic materials. Magnetic field lines. Electromagnets.
Electric charge. Production of electrostatic charges by friction.
Conductors and insulators. Electrons.
Electric field definition. Electric field of a point charge, of a charged conducting sphere and between oppositely charged parallel plates.
Electric current definition. Ammeters. A.c. and d.c. current.
Electromotive force (e.m.f.) and potential difference.
Resistance definition. Relationship of the resistance of a metallic wire to its length and to its cross-sectional area.
Electrical energy and electrical power. Equation for electrical power P=IV.
Definition of kilowatt-hour (kW h). Cost of energy.
Electric circuits with cells, batteries, power supplies, generators, potential dividers, switches, resistors (fixed and variable), heaters, thermistors (NTC only), light-dependent resistors (LDRs), lamps, motors, ammeters, voltmeters, magnetizing coils, transformers, fuses and relays.
Circuit diagrams containing diodes and light-emitting diodes (LEDs)
Series and parallel circuits.
Electrical safety.
Electromagnetic induction. Induced e.m.f. Motion of a conductor in a magnetic field. The a.c. generator (rotating coil or rotating magnet).

Magnetic effect of a current. Solenoid. Magnetic field of straight wires and solenoids. Force on a current-carrying conductor.
Relative directions of force, magnetic field and current.
The electric motor. The transformer. Advantages of high-voltage transmissions. Equation P=I^2R.

The nuclear model of the atom. Positive ions. Scattering of alpha particles and atomic models. The nucleus. Isotopes.
Detection of radioactivity. Background radiation.
Alpha (α), beta (β) and gamma (γ) emissions. Ionizing effects. Radioactive decay. Half-life definition. Half-life calculations from tables and graphs.
Safety precautions. Effects of ionizing radiations.
The Earth. Average orbital speed definition.

Desio, 8 giugno 2025

Il docente
MATTEO ERBA
Firmato con firma elettronica avanzata

Firmato dagli studenti rappresentanti di classe con firma elettronica avanzata