



## Physics Set - Uruguayan Bachelor's Degree

KE300FBC-URY

### Function

Function: Intended for the study of the principles of geometric optics, reflection, flat and spherical mirror, refraction, fiber optics, prism, lenses, waves, spring, interference, diffraction, electroscope, electric field, gas discharge, electric potential, dielectric strength, association of lamps in series and parallel, association of resistors in series, parallel and mixed, potentiometer, electric current, transistor, flip-flop circuit, logic gate AND, OR, NOT AND, NOT OR, magnetic field of a magnet, magnetic field generated by an electric current, magnetic induction, electromagnetic phenomena, MRU, MRUV, free fall motion, friction force, Newton's laws, MCU, work, mechanical energy, conservation of energy, looping, conservation of momentum, inelastic and elastic collision, projectile, angular momentum, moment of inertia, pendulum, thermal comfort, Leslie cube, black body radiation, thermal equilibrium, isothermal transformation, waves on a liquid surface, wave propagation speed, reflection, refraction and diffraction of waves, standing wave on a spring, Taylor's expression, waves on a string, sound, resonance, interference, beating, Doppler effect, sound sources, noise, physiological qualities of sound, reverberation of sound, open and closed sound tube, wavelength, colors, continuous spectrum of light, diffraction grating, Rayleigh scattering, vision, equipotential surfaces, Faraday cage, lines of force, DC circuit, potential difference, electric current, Ohm's law, non-ohmic resistor, Kirchhoff's law of loops and nodes, capacitor associations, diode, charging and discharging of a capacitor, RC circuit, Oersted's experiment, electrical transformer, Faraday's law, Lenz's law, Foucault's law, magnetic brake,

diffraction of light by holes and slits, polarization of light, photoelectric effect, spectral lines of Hydrogen, Helium, Mercury, Nitrogen, Oxygen, equi

**Knowledge areas**

Physical - Science and Fundamental Mathematics

**Level**

Graduation

**Key Experiments**

- The interference of two-dimensional waves on a liquid surface. - 1072.029J
- Influence of surface coating color on thermal comfort, multimeter. - 1093.114\_1
- The influence of surface coating on thermal comfort, Leslie cube, multimeter. - 1121.018\_1
- Blackbody radiation with Leslie's cube. - 1121.020\_1
- Thermal equilibrium. - 1052.003K2
- Formation and propagation of two-dimensional waves on a liquid surface. - 1072.012J
- Determination of the propagation velocity of two-dimensional waves on a liquid surface. - 1072.013J
- The reflection of a two-dimensional wave from a liquid surface. - 1072.016J
- The refraction of two-dimensional waves at a liquid surface. - 1072.020J
- Diffraction of two-dimensional waves at a liquid surface. - 1072.024J
- Faraday's law, Lenz's law and Foucault's law, the magnetic brake. - 1082.178
- Measurement of the wavelength of Mercury's spectral lines using a scaled busbar and high shoes. - 1062.004T2\_HG

**Physical - Optics - Reflection**

The principles of geometrical optics. - 1062.004S01

**Physical - Optics - Reflector Systems**

- Reflection in a plane mirror. - 1062.004S03
- Reflection in concave and convex spherical mirrors. - 1062.004S05
- Total reflection, optical fibers. - 1062.004S12

**Physical - Optics - Optical Instruments**

- An application of multiple reflections between plane mirrors. - 1062.004S04
- The relationship between the object, the lens and the image generated by the lens. - 1062.004S09
- Defects of vision, correction of hyperopia and myopia with lenses. - 1062.004S10

**Physical - Optics - Refraction**

- The refraction of light and its laws, the diopters. - 1062.004S06
- Total reflection, optical fibers. - 1062.004S12
- Refraction and dispersion of light in 90 and 60 degree optical prisms. - 1062.004S07

**Physical - Optics - Spherical Lenses**

Spherical lenses and their main characteristics. - 1062.004S08

**Physical - Wavelike - Waves**

- Main characteristics of waves in a spring. - 1072.011
- The standing wave in a spring. - 1072.011\_2
- Speed of propagation of a pulse in a spring, with multitimer. - 1072.011B
- Standing waves in helical springs, with tensiometer. - 1072.032E\_7
- Taylor's expression applied to a vibrating string, with tensiometer. - 1072.032E\_4
- Taylor's expression on vibrating strings of different linear densities, with tensiometer. - 1072.032E\_5

Resonance in open sound tubes. - 1072.074B

Determination of the speed of sound using a closed sound tube. - 1072.078B

Diffraction of light by a diffraction grating with a lattice constant of  $8.33 \times 10^{-5}$  m. - 1062.004D1

### **Physical - Wavelike - Wave Phenomena**

Laser diffraction by diffraction grating, grating constant  $1.00 \times 10^{-6}$  m. - 1062.003M1

The measure of the average wavelength of the colors in the continuous spectrum of light, interference. - 1062.004S11

The measure of the average wavelength of the colors in the continuous spectrum of light, interference. - 1062.004Q

Rayleigh scattering. - 1062.003N2

Diffraction of light by holes and slits. - 1062.003D

Comparing polarization between diode laser and polychromatic light. - 1062.003N

Measurement of the wavelength of the spectral lines of Hydrogen using a bus with scales and high shoes. - 1062.004T2\_H

Measurement of the wavelength of the spectral lines of Helium using a bus with scales and high shoes. - 1062.004T2\_HE

Measurement of the wavelength of the spectral lines of Nitrogen using a busbar with scales and high shoes. - 1062.004T2\_N

Measurement of the wavelength of the spectral lines of Oxygen using a bus with scales and high shoes. - 1062.004T2\_O

### **Physical - Wavelike - Periodic Movements**

The MCU, uniform circumferential motion. - 1032.060\_1

Centripetal force in an MCU with sensor and multitimer. - 1032.060C1

Centripetal force as a function of angular velocity with sensor and multitimer. - 1032.060C2

Centripetal force as a function of frequency with sensor and multitimer. - 1032.060C3

Centripetal force as a function of mass with sensor and multitimer. - 1032.060C4

The centripetal force as a function of the radius, when the mass of the object is constant in MCU. - 1032.060C5

### **Physical - Wavelike - Acoustics**

Sound, a longitudinal mechanical wave. - 1072.059

Sound - phenomena of resonance, interference and beating. - 1072.060

Sound, Doppler effect. - 1072.061

Sound sources, sound, noise and physiological qualities of sound. - 1072.067B

The reverberation of sound. - 1072.069B

The sound beat. - 1072.072B

Resonance in open sound tubes. - 1072.074B

Determination of the speed of sound using a closed sound tube. - 1072.078B

### **Physical - Electricity and Electromagnetism - Electrostatics**

The principle of operation of the foil electroscope and the distribution of charges in a conductor. - 1082.004

Playful experiment: Turning on a neon lamp. - 1082.026A

Fun experiment: Making a “fountain” with Styrofoam balls (or confetti). - 1082.026B

Playful experiment: Raising strips of paper. - 1082.026C

Playful experiment: Simulating a lightning rod. - 1082.026D

Playful experiment: Making someone's hair stand on end. - 1082.026E

Playful experiment: An effect of the “electric wind” - the turnstile. - 1082.026F

The electric potential and the amount of charge accumulated in the generator. - 1082.027

The equipotential lines and surfaces between point electrodes. - 1082.029C

The equipotential lines and surfaces between parallel plane electrodes. - 1082.030C

The Faraday cage and electrostatic shielding. - 1082.031C

## **Physical - Electricity and Electromagnetism - Electrodynamics**

Playful experiment: Turning on a fluorescent lamp. - 1082.026

Discharge in gases under atmospheric pressure. - 1082.012

Spark extension in the Van de Graaff generator and dielectric strength. - 1082.027A

The association of lamps in series. - 1082.044\_D

Parallel lamp associations. - 1082.044\_D1

The measurement of the internal resistance of a voltmeter - 1082.053A

The measurement of the internal electrical resistance of an ammeter. - 1082.054A

The association of resistors in series. - 1082.076\_D

The association of resistors in parallel. - 1082.076\_D1

The potentiometer as a voltage divider. - 1082.076\_D2

The mixed association of resistors. - 1082.076\_D3

Electric current can flow through the human body. - 1082.055\_M

The transistor operating as a switch. - 1082.055\_K

The transistor operating as a delayed-effect switch. - 1082.055\_L

The double-plate key circuit or flip-flop circuit. - 1082.055\_P

The AND logic gate. - 1082.055\_Q

The OR logic gate. - 1082.055\_R

The NOT AND (NAND) logic gate. - 1082.055\_S

The NOR logic gate. - 1082.055\_T

Configurations of power lines between electrodes, lightning arresters, Faraday cages and coaxial cables. - 1082.020A

The measurement of the potential difference between two points in a DC circuit. - 1082.053C

The measurement of electric current intensity in DC circuits. - 1082.054C

The association of resistors in series. - 1082.055\_A

The association of resistors in parallel. - 1082.055\_B

The mixed association of resistors. - 1082.055\_C

Ohm's law. - 1082.055\_D

Kirchhoff's mesh law. - 1082.055\_E

Kirchhoff's knot law. - 1082.055\_F

Series and parallel associations of capacitors. - 1082.055\_G

The function of the diode in the circuit. - 1082.055\_H

The charging and discharging of a capacitor. - 1082.055\_J

Electrical resistance, Ohm's law. - 1082.056A\_2

The identification of a non-ohmic resistor. - 1082.064A\_2

The equivalent of a series association of capacitors. - 1082.076\_E0

The equivalent of a parallel association of capacitors. - 1082.076\_E1

The RC circuit, with multimeters. - 1082.076\_E2

The function of a diode in a circuit. - 1082.088\_D

Kirchhoff's mesh law - 1082.088\_E

Kirchhoff's knot law - 1082.088\_E0

Measurements in electrical circuits and electrical power. - 1082.092A\_2

## **Physical - Electricity and Electromagnetism - Electromagnetism**

Identification of magnetic poles and lines of force in a magnetized object. - 1082.122

Mapping the magnetic field of a magnet - 1082.120

The magnetic field generated by an electric current in a straight conductor - 1082.161A

The magnetic field between two parallel, straight conductors carrying an electric current. - 1082.161B

The magnetic field at the center of a circular loop carrying an electric current - 1082.161C  
Magnetic induction inside a solenoid carrying an electric current. - 1082.161D  
Electromagnetic phenomena and electromagnetic induction. - 1082.128A  
The Oersted experiment and electromagnetism - 1082.127  
Electromagnetism, the sense of the magnetic field around moving charges, Oersted - 1082.127A  
The step-up and step-down electrical transformer - 1082.161E1  
Electromagnetic phenomena. - 1082.161E2

### **Physical - Mechanics - Kinematics**

The MRUV and its characteristics. - 1032.006\_D  
The meeting of two pieces of furniture in MRU with opposite directions, on the same trajectory. - 1032.005C1  
Free fall motion with test specimens from 10 different intervals. - 1032.010K4  
The MCU, uniform circumferential motion. - 1032.060\_1  
The principle of conservation of mechanical energy. - 1032.010K3\_1

### **Physical - Mechanics - Dynamics**

Determination of the coefficients of static friction and kinetic sliding friction. - 1032.048  
The fundamental law of dynamics, Newton's second law, multichronometer. - 1032.079\_A1  
Discussing energy in looping motion - 1032.111  
Conservation of momentum in an inelastic collision, multichronometer. - 1032.077\_A1  
Conservation of momentum in an elastic collision, multichronometer. - 1032.078\_A1  
The determination of the initial velocity of a projectile, considering the amount of linear movement. - 1032.065A  
The initial velocity of a projectile considering the angular momentum. - 1032.065B  
Determination of the moment of inertia by the period of oscillation of the ballistic pendulum. - 1032.065C  
Centripetal force in an MCU with sensor and multitimer. - 1032.060C1  
Centripetal force as a function of angular velocity with sensor and multitimer. - 1032.060C2  
Centripetal force as a function of frequency with sensor and multitimer. - 1032.060C3  
Centripetal force as a function of mass with sensor and multitimer. - 1032.060C4  
The centripetal force as a function of the radius, when the mass of the object is constant in MCU. - 1032.060C5  
The center of oscillation of the physical bar-shaped pendulum. - 1032.013\_A  
The center of oscillation of the physical pendulum in the form of a rectangular plate. - 1032.013\_B  
The center of oscillation of the circular plate-shaped pendulum. - 1032.013\_C

### **Physical - Mechanics - Static**

Work and mechanical energy in a system of mass and helical spring. - 1032.056AF  
The equilibrium conditions of a rigid body, Varignon's theorem. - 1032.035F  
The composition and decomposition of concurrent coplanar forces at  $90^\circ$  to each other. - 1032.040F1  
The composition and decomposition of concurrent coplanar forces at  $60^\circ$  to each other. - 1032.040F2  
Hooke's Law, the spring constant of a coil spring. - 1032.052AF  
Hooke's Law, the spring constant in an association of 2 helical springs in series. - 1032.052AF\_1  
Hooke's Law, the spring constant in an association of 2 helical springs in parallel. - 1032.052AF\_2

### **Physical - Thermophysics - Thermometry**

Isothermal transformation, Boyle-Mariotte, using a manometer. - 1052.032Q2

### **Physical - Modern - Quantum Mechanics**

The photoelectric effect and the ultraviolet filter. - 1062.008A

### **Miscellaneous Instructions**

Electric current can flow through the human body. - 1082.055\_M

The transistor operating as a switch. - 1082.055\_K  
The transistor operating as a delayed-effect switch. - 1082.055\_L  
The double-plate key circuit or flip-flop circuit. - 1082.055\_P  
The AND logic gate. - 1082.055\_Q  
The OR logic gate. - 1082.055\_R  
The NOT AND (NAND) logic gate. - 1082.055\_S  
The NOR logic gate. - 1082.055\_T  
The measurement of the potential difference between two points in a DC circuit. - 1082.053C  
The measurement of electric current intensity in DC circuits. - 1082.054C  
The association of resistors in series. - 1082.055\_A  
The association of resistors in parallel. - 1082.055\_B  
The mixed association of resistors. - 1082.055\_C  
Ohm's law. - 1082.055\_D  
Kirchhoff's mesh law. - 1082.055\_E  
Kirchhoff's knot law. - 1082.055\_F  
Series and parallel associations of capacitors. - 1082.055\_G  
The function of the diode in the circuit. - 1082.055\_H  
The charging and discharging of a capacitor. - 1082.055\_J  
Electromagnetic phenomena. - 1082.161E2

### **Chemical - Inorganic Chemistry - Study of Gases**

Isothermal transformation, Boyle-Mariotte, using a manometer. - 1052.032Q2

**cidepedigital.com.br** ✉ **cidepe@cidepe.com.br**

---

Victor Barreto Ave, 592 - Zip Code 92010-000 - Canoas - RS - Brazil