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Abstract

The course material includes experimental physics exercises for understanding the operation of basic devices and circuits for measuring electrical quantities (oscilloscope, analog and digital multimeters, Wheatstone bridge) and the construction of electrical circuits on breadboards. Important electrical/magnetic phenomena used in modern technology are studied, such as the resonance phenomenon in electrical circuits, the Hall effect (sensors), light transmission in optical fibers, and the use of wave optics phenomena to measure the length and speed of sound in liquids. It includes experiments for understanding the nature of light as interpreted by geometric optics (lenses, reflection, refraction) and phenomena that confirm the wave nature of light (interference, diffraction, polarization). It contains important experiments for future engineers: experiments for measuring length using the phenomenon of interference, experiments for measuring the speed of sound optically (standing waves), experiments for measuring optically active solutions (polarization), experiments measuring Planck's constant through the phenomenon of diffraction. It also studies linear spectra with a spectrometer and provides an experiment for understanding the propagation of signals through optical fibers and their application in telecommunications.

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