

In this thesis, a new experimental set for the Interactive Physical Laboratory (IPL), operated by the Faculty of Mathematics and Physics, Charles University, was designed. This experimental set consists of five units named: Measurement of Refractive Index, Malus's Law, Diffraction of Light on Grating, Polarization of Light, Young's Experiment. Most of the units consist of quantitative physics experiments in wave and geometrical optics, inspired by experiments appearing in Czech resources. For each unit, corresponding worksheets were prepared and tested. The worksheets are supposed to guide the students as they go through the experiments and related tasks. Each unit is described in the thesis including typical mistakes students tend to make and methodology for lecturers of the laboratory. The author's solution is included in attachments. A part of the thesis is also dedicated to the introduction of the necessary physics theory that could be used as a study material for visitors of the laboratory.