



METADATA

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Abstract

This textbook contains virtual experiments in Mechanics, Electromagnetism and Optics. Each chapter corresponds to an experiment and includes the theoretical background of the experiment, the experimental method, the simulation of the experimental setup and the corresponding worksheet. The worksheets are in stand-alone printable format and include both links and QR codes of the simulations, which are recorded in video format. In addition, for each experiment, there are evaluation criteria enriched with educational activities in the form of videos, related to the corresponding theory, which the trainees can carry out and answer corresponding questions. These activities can be used by teachers both in the laboratory and in the teaching of the respective courses. The virtual experiments presented in the book are simulations-models, with small variations, of the real experiments of the physics educational laboratory of the Department of Physics of the School of Applied Mathematical and Physical Sciences of the

National Technical University of Athens. Thus it is possible to use this book not only in the case of distance education, but also in the case of live teaching in the laboratory. More specifically, the contained virtual experiments could be leveraged: i. Alongside the actual experiment, so that students understand the role of models. ii. As additional exercises for better practice and assessment of students. iii. To familiarize the students with the experimental setup and procedure during their preparation for the corresponding real experiment. iv. In introductory courses on the processing and presentation of measurements. Various software was used to create the virtual experiments, such as Interactive Physics, Scratch programming language, Phet simulations, etc. The experiments were converted to video so that the trainee with observation and appropriate handling of the video could take measurements and complete the worksheets. We hope that teachers and students in Physics will find this book useful.