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**Yu.N.Nikiforov, Yu.L.Skorenky, B.P.Kovalyuk**

Ternopil Ivan Puluj National Technical University, Ukraine

## **PHYSICS LABORATORY: TEACHING AND EXPERIMENTS**

**Ю.М. Нікіфоров, Ю.Л. Скоренький, Б.П. Ковалюк**

Тернопільський національний технічний університет імені Івана Пулюя, Україна

## **ФІЗИЧНА ЛАБОРАТОРІЯ: НАВЧАННЯ ТА ДОСЛІДЖЕННЯ**

In this report we discuss teaching methods and physics laboratory experiments for foreign students, studying in Ukraine, described in our manual (Physics laboratory, Ternopil, 2016) based on the authors' personal and professional experiences developed from teaching a three-semester course in Physics for international students over a couple of years. The main aim of the textbook is to fill the still existing void for higher education Physics textbooks, especially the lab practicals, written in English by Ukrainian authors.

The primary purpose of the manual is to enable conformity and improve the practical Physics course materials being taught to Ukrainian and international students. One of the difficulties that became evident during the process of preparing the present manual was the different levels of background knowledge of various international students. Each country has its own teaching and learning methods and strategies for Physics. Some of the international students did not take any preparatory courses before entering Ukrainian universities. Different mindsets toward education, the desire to achieve high scores even with moderate physics reasoning ability, and various levels of academic confidence among the students were taken into consideration, as well. A thorough analysis of most popular Physics textbooks and secondary literature written in English and comparison with Ukrainian textbooks in terms of content, structure, and diagrams contributed to the emergence of this handbook. No doubt, virtual labs are becoming more and more popular nowadays. Researches have shown that computer simulated experiments and virtual labs have great potential for improving students' learning outcomes in a Physics practical. However, they will never substitute hands-on experiments. Performing an experiment in practice and finding the results of a specified lab project helps develop the basics for a systematic approach to solve forthcoming real-world technical problems. Therefore, a significant amount of time and work was put in to bring out this alternative version of teaching materials. It will not only help students studying engineering disciplines to learn the fundamental laws of nature but more importantly engender permanence of knowledge, and problem-solving skills.