Physics Curricula in Engineering Education at the Slovak University of Technology and Web Based Instruction

Miroslava Ožvoldová

University of Trnava in Trnava, Faculty of Education & Slovak University of Technology in Bratislava, Faculty of Materials Science and Technology

in Trnava, ozvold@mtf.stuba.sk, Pavlinska 16, 917 24 Trnava, Slovak Republic, Europe

At present, students of engineering universities represent nearly 50 % of all university students in Slovakia. To challenge the interest of students it is necessary to change the attitudes of secondary school graduates and to change also the university policy to make the study more attractive and flexible.

This contribution informs about the development of Physics education in the Slovak University of Technology (STU) in Bratislava and presents the results of the application of new Information Communication Technologies in the process of teaching of basic course of Physics.

The new Higher Educational Law introduced in April 2002 brought reorganisation of the form of study in the STU: former 2- degree study (MS and PhD) was replaced by a 3-degree one (BS, MS and PhD). Now a serial bachelor model is used as the first degree of university study. These changes have affected the position of Natural Science subjects, Physics in particular, and their hour dotation.

Thought the understanding of physical laws is highly important in technical thinking development, the range of the course varied in different periods. We can document it e.g. by the Faculty of Materials Science and Technology, where whole hour dotation (Lectures, Seminars and Labs) in 1997 was 9/7/3 compulsory hours and 1/2/0 optional hours, while since 2002 year compulsory dotation is 4/4/2 and optional dotation 0/2/0.

Departments of Physics at particular STU faculties are responsible for the content of teaching the basic course of Physics, which reflects the specific profile of the faculty. The aim of the course is to equip the graduates in bachelor´s degrees with comprehensive and logical system of knowledge in the field of classical and contemporary Physics, and experimental skill as well which s/he could use later in specialized study. Introduction into engineering Physics taught in the first semester is an integral part of this course. All those needs and requirements are reflected in the innovated syllabi of basic course of Physics.

Successful engineering education involves a number of requirements. Now we would like to concentrate and suggest the solving of problems arising from the insufficiently prepared students. We can see that the knowledge of students enrollonig, especially from Mathematics a Physics is declining. This has been confirmed by pilot testing of high school graduates since 1999. The average achievement of high school graduates in Physics in 2003 monitoring was only 30.7 %.

A team of university teachers from four Physics Departments of the STU developed a set of teaching material for a new Curriculum consisting of :

- e-Physics - the first multimedia Slovak textbook, / Physisc I, Physics II / available on http://kf-lin.elf.stuba.sk/~ballo/fyzika_online
- consultations and multiple-choice tests avaiable on http://kf-lin.elf.stuba.sk/~ballo/e4/.
- interactive CD-ROM as a supplement for Introduction into engineering Physics.

We hope that the new Web based instruction may be the right solution for enhancing the quality, popularity and effectiveness of Physics education. The explosive development of the

new Information Technologies - World Wide Web has provided what appears to be an educational and training system for future.