

DEVELOPMENTS IN TRAINING OF ELECTRICAL ENGINEERS

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Abstract

The conference, Virtual University, is repeatedly being held in the premises of the Faculty of Electrical Engineering and Information Technology, STU. Its tradition is more than 60 years old. Education of future electrical engineers, which is the main domain of the Faculty, dates back to 1941, when it started.. Since then both its name and premises have undergone substantial changes. It is probably useless to say that more changes, have been made in the Faculty structure alongside with the curriculum. All these changes have been made in the view of enhancement of quality of education, as well as its accessibility to a larger number of students. The whole system of study at FEI STU has been transformed. The period of the last 10-15 years encompasses two transformation periods of the system of study.

The first transformation period started by a preparatory process between 1990-1993. Implementation of the transformation then began in the academic year 1993/1994 and it was roughly completed during the academic year 1999/2000 when the first students from the second cycle programs graduated. This system of study is, to some extent, continuing even in these days. In the frame of the transformation process the former 5-years monolithic study programs in 10 specializations was replaced by a new two-cycle system of study. The first cycle (undergraduate programs) is represented by a 4-year bachelor study programs in five specializations: Automation, Electronics, Information Technology, Materials Engineering and Power Engineering, whereas the second cycle (graduate study programs) consists of five 1.5-year programs in the same specializations as in the first cycle. Both the undergraduate and graduate study programs were mutually adjusted as for the content, so that the graduates from the bachelor programs may continue in corresponding master programs.

All the students of the first year bachelor programs have the same curriculum, whereas in the second year it is split into two branches which are: 1. Automation and Information Technology, 2. Power Electrical Engineering, Electromaterial Engineering and Electronics. The essential principle of obtaining specialized knowledge is the opportunity of opting courses in the last years of

study. After a successful accomplishment of the study requirements, a pass in a final exam (including submission of a final project) a bachelor's degree is conferred. Master's degree in engineering is focused on deeper and more specialized knowledge and skills in the given areas. The degree (Ing.) is conferred after satisfactory accomplishment of the program, defence of a thesis and pass of the final exam. Postgraduate study is a significant part of university education.

The second transformation period is closely related to passing the new University Code in Slovakia in 2002. In accordance with this legal document all universities in Slovakia accepted a new system of study which fully compatible with the recommendations of the Bologna Declaration published in 1999. The most significant changes in the system of study at FEI STU as compared with the previous one, described above, are represented by the 3-year bachelor study programs and 2-year master programs. These changes were required due to the Code and so the Faculty management initiated a process of a full reconstruction of curricula both in bachelor and master programs. This process in fact started already in between 2001-2002 and it finished in 2003 when a package of 5 bachelor, 9 master and 18 Ph.D. programs was prepared for the accreditation process. Today the accreditation process has been successfully completed and in the academic year 2004/2005 the first students enrolled into the 5 new bachelor programs.

Following the latest notable development of the automobile industry in Slovakia and taking into the account a need for the suitably educated and skilled people in this branch the Faculty prepared and submitted for the accreditation a new bachelor program "Automobile electronics". We expect the accreditation process to be completed in the coming year.

The Faculty has introduced a credit point system to comply with the European Credit Transfer System. This allows that students may adjust the pace of study according to their adeptness and possibilities. Besides, the credit point system gives countenance to transfer to other universities or faculties either in the country or abroad to obtain more focused training.

The Faculty has been accredited to confer BSc. MSc. and Ph.D. degrees, to habilitate associate professors and to inaugurate professors by the Accreditation Commission of the Slovak Government. Moreover the Faculty has been also accredited by an international body of electrical engineers – IEE.

International cooperation of the Faculty is very well established. Its lecturers and researchers take part in a large number of different projects within different programs, thus enhancing cooperation with partner universities, institutions and industry. These activities form a solid financial share but they also contribute to enhancement of the quality of education through intensive international cooperation. The achievements are demonstrated and shared at scientific and specialists events, conferences, symposia, and workshops organized by the Faculty.

The infrastructure of the Faculty with more than a thousand computers, tens of computer laboratories and optical fibre based computer network raise the quality of training and scientific work.

This Faculty provides access to a large collection of scientific and specialist journals in electrotechnology, informatics, and applied physics and mathematics.

Today Slovak universities need to face a relatively new and rather demanding situation. Higher or further education needs to be provided to an increasing number of population. This is a very well understood claim seen in the fact that education is becoming a strategic area, in the world-wide scale, because it brings about development of the society. Another attribute of the today's situation follows from the fact that the present information revolution has qualitatively changed the character of the way of obtaining and processing new information. All the areas of a society are under such a fast development that information becomes rapidly outdated and so there needs to be a continuous access to new information. This changes the character of education per se. In this light, the quality of education plays a significant role.

Today we need to prepare our students to look at education from a wider angle. Learning is not just obtaining information. We need to concentrate on turning the students into active, independent and autonomous individuals who would seek after new information, new developments and new trends throughout their lives.

Open learning provides a good springboard to do so. Moreover, in the highly developed countries, university do not attend solely fresh secondary school graduates anymore. Demographic changes and the dropping number of young adults cause that an increasing number of middle-aged population needs university degree or retraining. Then the potential university students are traditional secondary school graduates; people with part time employment or unemployed people who are looking for retraining; adults who look for training because of advancement at work or just for fun; students seeking higher qualification; students sponsored by industry; professionals seeking higher systematic training. In these groups there is an increased percentage of elderly people; women; ethnic minorities members; handicapped people.

This requires that the educational system meets manifolded expectations. Thus the programs need to cover such requirements, as different work styles; different life styles; different study styles; different physical and psychological disposition; geographical differences; cultural differences; financial differences.

The traditional, face-to-face education cannot handle problems connected, for example, with resources. There are not enough of housing facilities, classrooms or laboratories. The cost of technical equipment, textbooks, software or material is rising, and also other countries, even if economically well developed, are not able to find sufficient funding. Even more so in Slovakia where subsidy to universities provided by the government has been permanently decreasing and universities fear a collapse of the tertiary education. So the problem of the day is to look for such forms of providing higher education which would save costs to universities as well as students. Maybe accepting the philosophy of new, progressive approaches to education, such as open learning, might be one possible answer.