Post-gradual education at the SUT Bratislava

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SUMMARY

Post-gradual education is integral part of the education process realized at the university. Different types (forms) of post-gradual programs and courses – doctoral study, special courses offered for the practice, courses for forensic engineers, etc. – offered at the SUT in Bratislava. Joint post-gradual education in civil engineering and geodesy supported by EU social fund – pilot project realized at the Faculty of Civil Engineering. Project skills and results. Courses offered in the field of cadastre, engineering surveying, GIS and GPS. E-learning tools used for course preparation. Co-operation with the Chamber of Surveyors and Cartographers in the field of post-gradual education.

1. INTRODUCTION

Post-gradual education is integral part of the education process realized at the university. According the Bologna agreement of Ministers responsible for education in Europe was the three level (three step) education accepted and build. The first and the second level build the part specified as pre-gradual phase (part), with the third part is given the frame for the different types of post-gradual education. There are offered following types of education:

- doctoral courses,
- courses for forensic engineers,
- special courses for practice,
- courses for members of the chamber of engineers,
- seminars and conferences oriented to different topics.

The doctoral (PhD) courses are realized according to the accreditation processes given by the Ministry of Education. In the field of surveying is accredited the common course of Geodesy and Cartography. This course haves tree year duration in full time and five years in part time study. The whole 180 ECTS of the course are distributed to the different parts of them:

- theoretical subjects (12 ECTS),
- special subjects (24 ECTS),
- publications (16 ECTS),
- research (112 ECTS),
- pedagogic activities (16 ECTS).

The individual study programme will build (designed) together with the student and have the form of individual education. Students are involved to research activities and the education process of the department. During the study could present four papers in professional journals, minimum one of them in foreign country. Naturally, the research and the main topics of PhD thesis are in the focus of the student activities. Finally the PhD thesis is disputed (defended) by three professors from different institutions.

Forensic engineering courses are offered in the field of surveying, cadastre and real property valuation. The course of one month duration included objects from the field of surveying, cadastre, legal sciences, economy and civil engineering. For the completion of courses are required the positive result of state exam include the final work (thesis) prepared by the participant.

Classical post-gradual courses are builds as short period and monothematic courses oriented to the new developments, technology and instrumentation in different field of surveying. These are the most used and preferred form of the practice for education of own personal. According to the interest of different companies, there are prepared courses for special topics.

The Chamber of surveyors and cartographers represent the highest level of professionals. According to the education system affiliated by the chamber, their members could take a part at the regular post-gradual education. This is controlled by the organs of the chamber each tree years. Parallel to the classical post-gradual courses the participation on seminars and conferences can be accepted.

Seminars and conferences organized by different professional organizations and universities fulfill the post-gradual education system. These are oriented to actually and new monothematic topics and give the possibility to the open discussion of the most actual professional problems.

2. JOINT POST-GRADUAL EDUCATION SYSTEM

The Faculty of Civil Engineering at the SUT in Bratislava started the project with the aim to build the complex post-gradual education system for civil engineers and surveyors. The project is supported by European structural funds, which enables the participation of professionals without payment. During the preliminary phase of the project the classification of prepared courses was made. It was prepared 28 courses, 24 in the field of civil engineering and 4 for surveyors.

According to the project aims are all materials, lectures and exercises prepared in e-learning form. The parts of courses are prepared using the Moodle FreeWare technology. Lectures, video sequences and texts are saved on CD-ROMs and distributed to the participants. All the courses are completed by e-tests, which are made by the participants in PC rooms of the faculty. In the future will be all courses offered via internet, without personally contact between the lectures and the participants. The extra web pages will be prepared and during the active course live for the discussion between the participants.

The courses offered during the pilot project are organized and located in special seminar rooms. Their hardware and software background of were supported by the EU project. According to the future e-learning form of study will be the adequate server centre designed and build as the organic part of the faculty IT Centre. This enables the parallel access for 200 participants in each time.

2.1. SURVEYING COURSES

The surveyor courses are oriented to GIS, cadastre, GPS and engineering surveying. According to the requirements given by Chamber of surveyors and cartographers is prepared the special course, which aim is to improve the future members of the chamber for the entrance exam. This course includes many important topics from the engineering surveying, cadastre and standardization as well as the legal regulations, which are important for the surveyors.

2.1. Course for cadastre

The aim of the course is to bring the new information in the field of cadastre according the new national and international legal regulations. The lectures start with the conceptual structure of the Slovak cadastre, the information system of the cadastre, their restitution and management. Discussed is the knowledge management in digital cadastre, cadastral vector map and their usage for model creation in geo-space. Outgoing from the documentation funds of Slovak cadastre the quality of cadastre is analysed. The role of cadastral inspection is presented.

The possibility of cadastral data for design and building of different information system will be presented. Specially, the design of LIS, ISU and object oriented IS are given in the course. Standardisation problems and questions of the IS design are discussed.

2.2. Engineering surveying course

The course is prepared for graduated students of BSc or MSc surveying courses. The main task of the course is to present new and actually information in the field of engineering surveying. There are classified following way:

- legal and technical regulation in engineering surveying and civil engineering,
- GPS technology, usage of permanent GPS stations for engineering tasks,
- new technologies in geodetic network building,
- metrological aspects of geodetic measurements,
- photogrammetry and engineering surveying,
- lay-out of civil engineering objects from the point of view the new ISO standards,
- crane rail measurement with new technologies,
- deformation measurement,
- data analysis,
- terrestrial laser scanners and their usage in engineering surveying,
- automated measuring systems – principles, design and applications.

2.1.3. Course for GPS

The aim of this course is to bring the participants basic knowledge about the global positioning systems (GPS) and the possibility to use this in geodetic practice. Information about the state of the art of the system, measurement and data processing methodology will be presented on the course. New trend and developments are discussed – GLONASS and GALILEO. Information is given about the Slovak permanent network and the new RTK possibilities.

The information prepared for participants are classified in lectures about:

- the basic information and configuration of GPS, their perspectives and developments,
- co-ordinate reference frames used by GPS technology,
- measurement principle of pseudo random codes and phases,
- mathematical principles of data processing, basic GPS modules,
- GPS measuring methods and their characteristics from the point of view the accuracy, velocity and effectiveness,
- transformation of GPS data to the reference frame
- the future of GPS's, permanent GPS networks.

2.4. Course for Chamber of surveyors and cartographers

The course is offered to the future members of the Chamber of surveyors and cartographers. The aim of the course is the preparation of the participants to the entrance exam of the chamber. There are presented information about the legal and technical regulations in surveying, automated information system of geodesy, cartography and cadastre in Slovakia. The lectures about the new developments in the filed of geodetic networks, GPS, photogrammetry, engineering surveying, data analysis and GIS are prepared.

2.5. GIS course

The course is offered to the students with graduation in the field of GIS, geography, geodesy, cartography and cadastre as well as the specialist with activities in the above-mentioned topics and are oriented to design and usage of GIS as a effective tools for management of different field of human interest. From this point of view are GIS understand as a technology for data acquisition, analysis and visualisation. The course offer know-how in the field of collection and maintenance of 2D and 3D attributes of geo-objects, know-how about the geo-data quality evaluation. Supported are the understanding of standardisation principles, meta- data and meta-information structure and the integration and interoperability of heterogeneous data structures in GIS.

3. RESULTS AND SKILLS

To this time were realized two courses – the cadastre and the GPS. Next courses are prepared for the months April, May and November of this year. The participants of the realized courses are valued both of courses very positive, which presented in the

questionnaires fulfilled the last day. All participants conveyed the important role of these courses in the continual education of professionals. The e-learning form are underlined from the point of view the existing possibilities (free and personal time schedule of learning process, broad access to the internet) of professionals in Slovakia.

The pilot project was supported by European social fund and was focused to the professionals of the capitol region. Prepared courses are realized by full time study form supported by CD-ROMs, video sequences and e-tests. There are e-learning courses and materials prepared during the project, which enable the access of participants from the other regions of Slovakia, too. For this reason the special hardware will be installed in the faculty computer centre.

The legal and regular realization of courses in Slovakia needs the accreditation of these. According to the relevant regulations for the accreditation of these courses are prepared the complete materials for the Ministry of Education. This process will be start next months.

REFERENCES

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NOTES

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BIOGRAPHICAL NOTES

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Study of Geodesy and Cartography at the University of Bratislava, doctoral degree (PhD.) 1986, 1987-1998 Senior Lecturer at the Department of Surveying of the Slovak University of Technology in Bratislava. Since 1998 Associate Professor at the SUT in Bratislava.

Guest lecturer and research worker at the University of Technology Budapest (Hungary), University of Technology Vienna (Austria) and the Slovak Academy of Sciences in Bratislava. Lectures at the Technical University of Dresden (Germany), Technical University

of Novosibirsk (Russia), University of Technology Vienna (Austria), Technical University of Brno and Czech University of Technology in Prague (Czech Republic), University of Miskolc (Hungary) and Research Institute of the Hungarian Academy of Sciences Sopron (Hungary).

Member of FIG Working Group 6E (1995-1998), FIG Working Group 6.2 (2002-), Special Commission 4 of IAG (1997-2001), Editorial Board of the Geodetski list (Croatia) and the Proof Commission of the Slovak Board of Surveyors and Cartographers (1998-), Chairman of the TC 89 Geodesy and Cartography for STN in Slovakia (1999-). Author of 1 book, more than 75 publications and 45 conference presentations, editor of 3 books.

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