

## **FIRST RESULTS OF "BACHELOR" TUITION OF SPECIALITY "MINERAL EXTRACTION"**

**Krastu Dermendjiev**

University of Mining and Geology "St. Ivan Rilsky"  
Sofia 1700, Bulgaria

### **ABSTRACT**

The first results of bachelor curriculum tuition of speciality "Mineral Extraction" are summarized. Some proposals, aiming amelioration of volume and quantity of tuition are made.

### **SHORT HISTORY**

Speciality "Mineral Extraction" starts 1950 with definite targets, field of activity and professional realization of specialists for country conditions. More than 52 years the university prepares specialists and the number of graduated mining engineers is about 2500.

During the years the name of University was "Institute of Mining and Geology", "Higher Institute of Mining and Geology" and now is "University of Mining and Geology". At the period 1953- 1976 the name of speciality was "Mineral Extraction", during the period 1977- 1987 was "Technology of Mine Production", 1988- 1997 is "Mineral Extraction" again and 1988- 1997 was "Mining Engineering". Since 1998 under "Unified Government Requirements" the name of speciality is "Mineral Extraction" in three degrees of qualification- "Bachelor", "Master" and "Doctor".

During above mentioned periods on the fundament of main speciality some specializations were established: since 1963 "Underground Mining" and "Opencast Mining"; since 1982 "Underground Construction", "Economics, Organisation and Management of Mine Enterprises" and "Geotechnology". Some latter, 1994 specialization "Geotechnology" was closed down and the name of "Economics, Organisation and Management of Mine Enterprises" was changed to "Mine Management", latter "Industrial Management".

Fundamental and special student training and graduation from main speciality and specializations was organized by the departments "Mining" (1950- 1984), "Opencast Mining" (since 1963), "Economics, Organisation and Management of Mine Enterprises" (since 1982), "Underground Mineral Extraction" and department "Mine Construction" (since 1984) (created after department "Mining" closing). Now the name of department "Mine Construction" is "Underground Construction".

Changes of social and political life in the country affected system of higher education too. Higher Institutes names changed to Universities, including University of Mining and Geology too and they obtained big autonomy. In the period 1990- 1996 a wide discussion about introduction of three qualification levels of education bachelor, master and doctor (so called Anglo- Saxon education system) took place. Very many disadvantages of the system were pointed out, but in spite of them the system was imposed by the "Government Register of Educational and Qualification Degrees and Specialities in Higher Schools of Bulgarian Republic" and was confirmed by Council of Ministry decision No 86/12.03.1997, published in Government Newspaper No 24/1997.

On the base of this document the speciality was transformed to "Mineral extraction" with code 8.11.1 and three education-qualification degrees: bachelor, master and doctor and two scientific directions: 02.08.03. "Underground Mineral Extraction" and 02.08.04 "Opencast and Underwater Mineral Extraction".

In accordance with the Register "Unified Government Requirements" were worked out and Regulations latter confirmed by the decree of Council of Ministry No 201, published in Government Newspaper No 105/1998.

According to the new documents requirements were discussed and accepted: qualification characteristics of professional direction of degrees "Bachelor" and "Master" their curricula; the report, concerning results of evaluation of speciality "Mining Engineering" regarding it transformation to "Mineral Extraction"; Project for speciality transformation. On the base of this documents, at the end of month November 1998, at the National Agency for Assesment and Accreditation, a procedure was opened for initial accreditation of the speciality for 5 years (1998- 2004 year). Unfortunately, the procedure was terminated without any success.

For the first time students for bachelor degree, curriculum "Mineral Extraction" began their studies 1998/1999 school year. Their number was 80 students. At the end of the year their

number decreased to 64 and 16 of them give up their studies. During 2001/2002 school year in fourth course, number of the students was 43 and all of them successfully terminated the year.

During 2002/2003 school year the number of students for the last term was again 43. The last term was successful for 38 of them and they received their task for diploma work. Five of them postponed their graduation.

Distribution of graduating students was: 15 students in "Opencast Mining and Blasting Works" department, 8 of them in "Underground Mineral Extraction", 9 students in "Underground Construction" and 6 in "Mine Ventilation and Safety".

For comparatively short period for pre- graduation practice (02. 12. 2002- 14.12.2002) and diploma work elaboration (16.12. 2002- 08.02.2003) the bigger part of students (50 of them) graduated on first session and Government Examination Commission awarded all of them degree "Bachelor".

The medium level of marks of the students during their studies was "Good" 4,45 and varied between 3,80 and 5,16. Average level of marks on diploma works was "Excellent" 5,51 and of their defense "Very good" (4,45). On diploma works the highest mark received 8 students and for the defense- 9 of them. Only 3 students received marks under 4,5 and could not continue their education for "Master" degree.

For "Master" tuition continued 18 bachelors- 10 of them on government account and 8- on their own account. Distribution of these students is as follows: "Underground Mineral Extraction"- 2 students; "Opencast Mining "- 10 students, "Techniques and Technologies of Blasting"- 2, "Underground Construction"- 2 students.

Training for "Master" started March 2003 year.

#### ANALYSIS OF FIRST RESULTS

The author was directly engaged in preparation of curricula, introduction of the new educational system as well as a participant of theoretical and practical training of the students in two very important subjects. This permits him to make an analysis of tuition for bachelor degree.

This analysis includes content and volume of curricula; width of student training and specializations; way of training conclusion; themes, volume of diploma works and their defense; following training for "Master" degree.

Positive step of new system introduction was the removal of specializations at bachelor level and introduction of base speciality "Mineral Extraction". Not commenting the name of speciality we think it is enough broad to include the wide range of main and secondary activities and problems, concerning organization, execution and management of mining as a nature of the operations and so as a target of a safe and ecologic extraction of minerals.

This breadth, connected with natural circumstances as conditions, wide engineering and special knowledge of technics and technologies as a fundament is very difficult to be realized as a time and range without specializations. That why at system introduction, having in mind curricula amelioration, a perfect elaboration was necessary of qualification characteristic of the "Mineral Extraction" specialist for different qualification degrees. In this characteristics efforts were directed in two directions: functions, knowledge and skills of the specialist "Mining Engineer for Mineral Extraction" and on this base all parameters of studies documentation to be put on.

Two ways of curricula elaboration existed. First one was: from existed curricula, narrow specialising subjects to be taken out and fundamental subjects to be reinforced. The second one was: all existing subjects to be retained, but their horarium to be decreased. Unfortunately the second way took place because of interests of different departments and teaching staff. In curricula remained nearly all subjects, consisting the previous curricula for speciality and specializations.

Curricula became very heavy, more heavy then "Mining Engineering" ones for any specialization. This reflected in quality of special training of students, including knowledge of the object (engineering and geologic knowledge). Required knowledge, forming the image of the speciality, was not adopted and stabilized by the big quantity of students, and as it was evident from examination results and diploma works defenses, their level was not higher than journalists one.

This conclusion showed, that as a result of the big number special and specializing subjects, student's knowledge had to be made much wider, and students lost the targets and activities, which are its main professional characteristic. It is evident, that some changes in curriculum must be made and first way of its elaboration to be applied. This improvement could take place during corrections, which passed 2002/03 school year, but unfortunately it didn't happen because again was applied the second way- all existing subjects to be retained, but their horarium to be decreased.

The influence of specializations and departments, taking care for student's graduation, reflected on diploma themes and on process of graduation.

There was not any difference in diploma themes presented from the departments from the themes defended under previous curriculum even in these, presented from department "Mine Ventilation and Safety". All of the themes were narrow specialized and only 33% of defended diploma works possessed titles and contents tied with qualification characteristic of the speciality and graduation degree. For about 45% of diploma works titles and contents were very narrow specialized and did not correspond with the knowledge obtained by students. Elaboration of this works was not possible without big participation of the leading professor and usage of its computer programs. For about 22% of diploma works themes had no connection with the targets and activities of the mining engineer for mineral extraction.

Analysis of this results shows, that departments "Opencast Mining and Blasting Works", "Underground Mineral Extraction" "Mine Ventilation and Safety" and "Mine Construction"

practically divided students in specialization at bachelor level. Tasks, out of the competence of mining engineer were put and this made difficult decision taking of graduated bachelors in their choice of direction for master training.

Speciality on bachelor level is without any specializations. Graduating students were correctly assessed by the joint Government Examination Commission nevertheless diploma works were guided by professors of different departments. Structure, content and way of preparation of diploma works showed, that every one of them carries the elements, inherent to previous requirements. This generally means that leading professors of graduating students do not know qualification characteristic of the specialist on relevant qualification level and they follow their own or decided by the department structure, content and form of the diploma work. Differences were easy evident by students drawings, presented at diploma works differences.

Differences described make difficult not only organization of student's labour for diploma work elaboration, but work of Government Examination Commission in utilization of general criteria for diploma work estimation too.

### CONCLUSIONS

Analysis of education documentation and first results from bachelors graduation of speciality Mineral Extraction Engineers showed, that urgent training and methodical documentation amelioration is necessary in directions as follows: improvement parameters of students training by

decreasing horarium, and transfer specializing subjects from

bachelor to upper educational levels, including more wide studies of geological and mining fundament; way of graduation bachelor degree could be by a state final certification examination not with diploma work; if the graduation continues by diploma works, themes must be mine- technological ones with many partial problems, corresponding to qualification characteristic of speciality "Mineral Extraction" and themes to be prepared exclusively by Opencast Mineral Extraction" and Underground Mineral Extraction"; themes, requirements for content, volume, form, presentation and defence of diploma works to be coordinated between the above mentioned departments.

If so defined recommendations would not be realized in short time, new educational system could not be effective and students training for "Mineral Extraction Engineers" must be brought back to previous regulations "Mining Engineer- Master"

### REFERENCES

- Decree of Council of Ministry No 201, published in *Government Newspaper No 105/1998*.
- Decree of Council of Ministry No 162/2002, published in *Government Newspaper No 76 /2002*.
- Educational documentation for accreditation of speciality 'Mineral Extraction" with introduction of graduation levels, University of Mining and Geology, XI, 1998
- Curriculum for speciality 'Mineral Extraction", improved after Decree of Council of Ministry No 162/ 2002, III University of Mining and Geology.