



BOLOGNA PROCESS: REFORM OF ENGINEERING EDUCATION IN GERMANY

(Prof. Johann Wörner, Rector TU Darmstadt, Germany)

On the 10th of June 2004 the TUM's Senate hosted Prof. Dr. Johann Dietrich Wörner, rector of the Technical University of Darmstadt, Doctor Honoris Causa of the TUM, who has delivered a presentation on the issue "Reorganizing Higher Education in Germany in the context of Bologna Process".

The vital importance of the issue for all the higher education institutions in the Republic of Moldova has gathered altogether rectors and representatives of these institutions. The Ministry of Education was represented by vice-minister Ms Viorelia Moldovan-Batrinac.

The Bologna Process aims to create a European Higher Education Area to facilitate the mobility of students and teachers, to strengthen graduate

employability on the common European labour market. This requires all universities to restructure their curricula and courses as to meet the new demands.

One of the key points of the Bologna Process is quality assurance. To ensure and support high quality at the TU Darmstadt, a special attention is paid to the principle of unity between teaching and research.

Another key point of the Bologna Process is the organization of the education system in two cycles. Rector Wörner mentioned that TU Darmstadt will implement the 3+2 scheme, which allows students to receive a Diploma after 3 years of studies and enroll in the labour market as technicians, not as qualified engineers. The second study cycle

(2 years) will award the graduates with a Diploma of Engineer. After the 3 years of study, students can continue their education (2nd cycle) at a different university. The 3+2 system implemented in universities of various profiles will ensure a high mobility within Europe. The next stages in the new study system are represented by Master's and PhD courses.

In Moldova the admission is based exclusively on the Baccalaureat exam results. This will allow to introduce speciality subjects from the 1st year of studies, thus 3rd year students will possess the competencies, skills and qualifications stipulated by the Diploma. Hopefully, step by step this new objective will be accomplished.

French Departments at the TUM

French Departments „Informatics” and „Food Technologies” have been set up in September 1997 with the support of the Francophone University Agency and the Technical University of Moldova. Their main aims are:

- to provide high-quality French-delivered teaching of licentiate engineers in the fields of informatics and food technologies, comparable to that of prestigious francophone schools;
- to provide high technical education using more flexible structures based on innovations proposed by partner universities;
- to offer opportunities for the recognition of studies (one semester or one year), in order to facilitate the exchange of students within the cooperation programmes carried on jointly with partner universities;
- to promote new teaching technologies in higher education;
- to contribute to the formation of specialists with management skills, able to integrate easily in multicultural environments, having clear vision of the problems to be solved;

• to promote francophone culture in the region, country and international community.

Along the years of its existence, French Department „Informatics” carries on its activities according to well coordinated curricula, similar to those of partner universities, members of the French Department Consortium:

- Mediterranean University (Aix Marseille II) from France
- University Laval from Canada as well as other partner universities:
- Technical University from Sophia, Bulgaria
- Polytechnic University from Bucharest, Romania
- National Polytechnic Institute from Toulouse, France

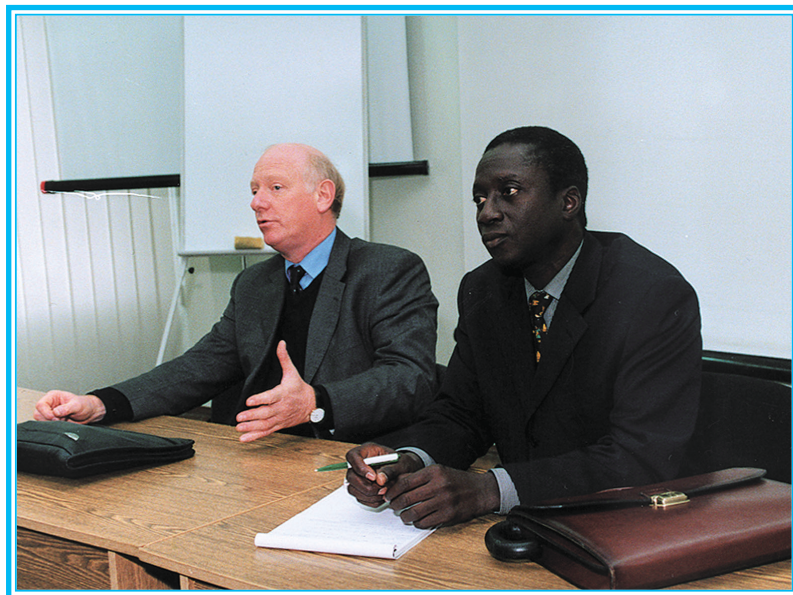
Admission to the French Department is free for the students enrolled at university, supplemented by 2 exams: mathematics and French. Every year

24-25 new students are enrolled at the French Department, the admission contest being 2-3 candidates students. During its 7 years of existence the Department has educated 191 students. The graduation rate is 92%.

During its existence, the teachers of the Department have won 15 scholarships at partner universities from France and Canada, with a total duration of 23 months. 10 invited teachers from partner universities have delivered courses to students. At the same time 3 teachers from the French Department of the TUM delivered courses at French Departments in Romania and Bulgaria.

The mobility of students is ensured in two ways: 10-month study scholarships at partner universities as well as cultural and professional scholarships in French speaking universities and enterprises.

The teachers and students of the French Department are actively involved in scientific and educational programmes, as well as other events.



Starting with 2004 co-tutoring of PhD studies jointly with partner universities has started.

The strengthening of scientific and pedagogical collaboration with partner universities from the region and other French speaking countries facilitates the integration of engineering education

from Moldova in the European higher education, in the context of Bologna Process.

Univ. prof. Dr. Victor Şontea, Director of the French Department „Informatics”

Students' Mobility – Criterion of Integration in Bologna Process

The cooperation between universities from European countries (and within this cooperation must be mentioned students' mobility) has a great importance in the context of Bologna process and integration in Europe. Technical University of Moldova (TUM) realized the first steps in this direction by implementation of European system of transferable credits and by first attempts of students' mobility from francophone, Anglophone and German departments, firstly for realization of practical courses in France, Canada, Belgium, etc. During the last four years 160 students got scholarships for linguistic and specialized training courses in these countries. Beside this, are used the possibilities offered by French Alliance from Moldova, Francophone University Agency – 1-2-years scholarships for universities from France. Germany also offered the Sherer scholarships for our students, for example for Technical University of Darmstadt. Some European countries offer scholarships by their agencies from Republic of Moldova. Such opportunities were used by students from the Faculty of Energetics and the Faculty of Food Technology.

There are also great possibilities for continuation of post university studies (Master's and PhD. studies, the last can be realized sometimes as jointly supervised doctorate) on the base of bilateral agreements between TUM and about 50 universities, included those from I.S.C. The most frequent are the cooperation agreements between TUM and French universities. Here can be mentioned the case of Mrs. Ludmila Ungureanu, the present head of the chair of Foreign Languages, and Igor Blindu, senior lecturer at the chair UNESCO/Cousteau of Echotechnics, Ecologic Management and Water Engineering, which defended this year the theses.

The graduate of the speciality Water Management and Protection (1996) Igor Blindu was engaged as assistant at the chair. In 1997 he applied for thorough studies within the project of cooperation of the mayorality of Chishinau and Saint-Etienne from France, regarding the implementation of a Geographical Informational System in water supply administration of the city. So, he got the possibility to continue his Master's degree studies at the Mine National Superior School of Saint-Etienne, France in the academic year 1998/1999 and defended his graduation paper in the field of Science



and Technology of Waste on 05.07.1999.

Then he was proposed to continue his investigations within PhD. studies in the same institution in the field of Earth and Environment's Sciences. So, he continued his studies (being the scholarship holder of French Alliance) on the theme – “Elaboration of diagnostication methods of water network of Chishinau by spatial and temporal analysis of hydraulic dysfunctions”. This work was realized jointly with the Centre of Sciences, Information and Technologies of Environment Protection from the Mine School of Saint-Etienne and the respective chair of TUM.

It was realized under the leadership of Didier Graillot, assisted by Mireille Batton-Hubert from France and Dumitru Ungureanu (TUM, Moldova).

The thesis was defended successfully on 12.05.2004 in front of a joint commission, where participated also the coordinator – D. Ungureanu and the head of the chair Sergiu Calos (as reviewer). Igor Blindu got the title of PhD. at the speciality “Sciences in the field of environment”.

Another typical case is that of Liliana Juc - graduate of the speciality Engineering and Management in Environment Protection (2003).

Liliana Juc was enrolled at TUM in 1998. She was selected by French Alliance, being offered the opportunity to study for a year in France, at the National Institute of Applied Sciences (INSA) from Lion. Then she came back to TUM. In the 5-year she got a 6-months scholarship for the realization of the graduation paper within the laboratory of Applied Chemistry and Environment of INSA.

In the academic year 2003/2004 she continue Master's degree studies in the field of inorganic chemistry at Claude Bernard University of Lion. The theme of her graduation paper – “Absorption of textile colorants from effluents of textile enterprises on activated coal”.

In the academic year 2004/2005, as a result of the agreements between TUM and Claude Bernard University, regarding the jointly supervised doctorate and obtaining of a scholarship of Francophone University Agency (FUA), Liliana Juc was given the possibility to continue PhD. studies at TUM and University of Lion. So, she will continue jointly supervised doctorate on the base of mutual agreement.

As a conclusion we can say that not only our students are offered the possibility to continue studies abroad. So, Miss Jilona Westram, student at University of Karlsruhe (Germany) and PhD. student Carlo Ricci at the University of Cagliari (Italy) passed a scientific training course in the Laboratory of Semiconductor Structures of Small Sizes of TUM and AES. Quentin Legrand from France studied for 2 years at the Francophone Department of TUM.

D. Ungureanu, Vice-rector TUM

