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**QUALITY ASSURANCE  
OF THE NATURAL GASES ENGINEERING EDUCATION  
IN ROMANIA**

**1. INTRODUCTION**

Since the law no. 88/1993 regarding the accreditation of higher education institutions and acknowledgement of diplomas was adopted in Romania, the Romanian higher education system has passed through several important transformations, and after the signing, in 1999, of the Bologna Declaration, Romania became a member of the “Bologna Process” which seeks to set up, until 2010, the European Higher Education Area through new changes and transformations. The assurance of academic quality is one of the central objectives of the Bologna Process. Its realization depends on the correlations established between the senses of academic quality and the transformations taking place in higher education.

Beginning with the university year 2006–2007, the Romanian Ministry for Education, Research and Youth has elaborated a new Methodology for quality assurance, provisional functioning authorization and accreditation of study programs and of higher education universities, in order to align the Romanian education system to the international requirements and standards and to the legal provisions set up at European level.

The assessment of the Romanian universities quality is realized taking into account an external dimension and an internal dimension.

The external quality dimension is instituted by the Bologna process, that is based on a programmatic document – the “Bologna Declaration” (1999), adopted by all ministers in charge of higher education from the countries of the European Union.

The internal dimension of academic quality is constructed based on the legislation currently in power and on the specifics of each university, the tradition and cultural patrimony of the Romanian higher education. In this context, the quality assurance becomes a process

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adapted to the existing institutional specifics and is instituted as a mechanism by which academic results or performances are improved.

In order to ensure the quality of education, analyses are undertaken on three domains:

1. Institutional capability
2. Institutional effectiveness
3. Quality management.

## **2. THE INTERNAL ASSESSMENT REPORT FOR THE NATURAL GASES ENGINEERING EDUCATION STUDY PROGRAMME FROM THE “LUCIAN BLAGA” UNIVERSITY OF SIBIU**

The analysis of the study programs in Natural Gases Engineering started from the SWOT analysis, carried out for verifying the accomplishment of criteria and standards required by the accredited programs. The analysis emphasized following elements:

### **Strong points:**

- existence of a professionally well-trained academic staff, with adequate teaching experience;
- participation of the faculty members in continuous training programs;
- well-represented material base of the study programs;
- existence of a preoccupation for the continuous renewing of the equipment, apparatuses and dedicated software;
- continuous improvement of the quality of teaching and research rooms;
- high quality of research carried out by the faculty members comprised in the study programs, published in prestigious speciality journals, indexed in international databases;
- contract-based research activity materialized in the obtaining of grants totalling more than 50,000 Euro;
- existence of two nationally acknowledged research centres;
- existence of a pro-quality culture;
- existence of a performing computer and communications infrastructure – intranet and internet network in laboratories and cabinets, including wireless access;
- existence of research programs developed in cooperation with other national and international research centres;
- existence of a speciality library with many recent publications;
- teaching and research experience gained by the faculty members through specializations in EU countries (Germany, Poland, UK, Italy, France, Slovakia, Spain) and in the USA.

### **Weak points:**

- low number of titular faculty members with ages under 35 years;
- lack of a continuous marketing strategy;
- lack of study programs in foreign languages;
- insufficient internal communication, both on the horizontal and on the vertical (resulted from the institution’s masculinism and individualism).

**Opportunities:**

- the local economic and business environment is attractive for foreign investors;
- acute lack of specialists in manufacturing science on the workforce market;
- presence of multinational companies in Sibiu, with a modern management, open towards the cooperation with the Engineering School;
- the geo-political context of Romania, through its adherence to the EU and NATO;
- positioning of the university in the central area of Romania;
- status of “European Capital of Culture” held by the city of Sibiu in 2007;
- good integration in the local and university community.

**Threats:**

- legislation, centralist and non-stimulative policies;
- under-financing from the state budget;
- insufficient motivation of the higher education personnel;
- insufficient motivation of the youths to succeed in the university hierarchy;
- low level of extra-budgetary resources;
- rapid decrease of the number of potential candidates, due to the decrease of the birth rate in Romania;
- competition of education systems through the existence of universities that offer low-quality educational services;
- increase of the level of bureaucracy and the loading of faculty members with collateral activities, that “steal” from the time allocated to research activities.

**3. ANALYSIS OF THE ASSESSED STUDY PROGRAMME, BY DOMAINS****3.1. Institutional capability**

The mission of the evaluated study programme is to train specialists for conception and execution, for the design of products and extraction technologies, or of technological equipment, with capacity to manage and monitor activities in companies, at European and world level. For this, the curriculum has to be dynamic, in line with the market’s requirements and at the level of other similar centres from Romania and from abroad. It contains fundamental and speciality disciplines meant to develop the creative thinking, the economic and managerial thinking, as well as disciplines related to communication and managerial behaviour. The theoretical disciplines are supported by practical and laboratory activities, as well as by the realising of technological practice stages within national and multinational companies from Sibiu and from the Central European region (Hungary, Slovakia, Poland, Ukraine).

The curriculum based on the European Credit Transfer System has been elaborated by a collective of specialists from the study programme Natural Gases Engineering, with the help also of:

- Curricula of other Romanian and international universities;
- Specialists from companies that unfold specific activities.

The academic staff involved in the analysed study programme has a high qualification, consisting of scientific personalities acknowledged on national and international level. In

the programme there are titular faculty members and associated faculty members from the speciality industry, that take part in the laboratory and scientific research activities.

The material base required for the unfolding of the assessed natural gases engineering study programme is provided by the “Lucian Blaga” University and is according to the standards for the unfolding of a high-quality education process. The university has study and research laboratories that are appropriately endowed, as well as libraries comprising over 500,000 titles and offering also access to on-line databases.

The study programme includes also tuition fee paying students, and the costs corresponding to this fee are calculated according to the average education costs per study year from the public education system financed from the state budget. The students may benefit from financial assistance from the university, through performance, study and social scholarships, regulated through internal regulations.

### **3.2. Educational efficiency**

The recruitment of students for the analysed study programme is done through own admission procedures, based on the candidates’ baccalaureate diploma which offers them the right to enrol for the admission contest and on the admission regulation, that respects the principle of chances equality of all candidates without discrimination, applied transparently and rigorously. The admission is based exclusively on the candidate’s academic competencies and there are no discriminating criteria. At the admission there is no distinction between the graduates of various high school types, the previous training of candidates thus not being a discriminating criterion.

The admission is done in falling order of the average grades of the candidates, as follows:

- On study positions financed from the state budget;
- On tuition fee based study positions (day courses);
- On tuition fee based study positions in long-distance learning and low-frequency education forms (if there are any available).

The admission for the first study year of the bachelor studies, with options contest for all domains, is done based on the weighed average grade of the baccalaureate average grade (50%) and the grade obtained at the baccalaureate at the exam mathematics/informatics (50%).

The promotion of students from one study year into the next one is regulated function of the transferable credit system, according to the accumulated number of credits, and the final licence exam is held at the “Lucian Blaga” University, which has the status of accredited university.

The gained knowledge, competencies and abilities allow graduates to get employed, to continue their education in the higher, master cycle and to attend continuous education. Thus, 54.4% of last year’s graduates are employed on positions that are according to their university training and 26.2% continue their studies through master study programmes.

Within the Engineering Faculty of the “Lucian Blaga” University, to which the assessed study programme belongs, there functions the Department for the Students’ Career Orientation, that offers career development programmes targeting the continuous optimisa-

tion of the personal and professional abilities, as well as the solving of problematic career-related situations.

Also within this faculty there are doctoral schools in domains such as: Industrial Engineering, Natural Gases Engineering, Mechanical Engineering, Materials Science, Computer Science that contribute to the training of young researchers. The results of the unfolded researches are published in national and international speciality journals.

### **3.3. Quality management**

Within the “Lucian Blaga” University of Sibiu there functions the Department for Quality Assurance, whose mission is to create a quality management system based on a policy, an organisational structure and on procedures that allow quality assurance, its evaluation and its continuous improvement. In this way, a culture of quality is promoted within the institution.

The Department for Quality Assurance has elaborated procedures for quality assessment based on the policy and the strategies established by the University Senate Commission for Scientific Research and Quality Management. The regulations, procedures and assessment criteria were approved by the Senate of the “Lucian Blaga” University of Sibiu.

The university has regulations regarding the initiation, approval, monitoring and periodical assessment of any study programme and of the diplomas, it being applied rigorously and consequently.

All proposals for new study programmes require the previous approval of the Faculty Council, of the Vice-Rector in charge of the teaching activity and of the director of the Department for Quality Assurance. After the approval, the programmes are subjected to validation by the University Senate Commission for Scientific Research and Quality Assurance.

The curriculum and diplomas are elaborated and emitted according to the requirements of university qualifications. The programmes' graduates will be granted engineering diplomas in the domain “Natural Gases Engineering”, the acquired qualifications being in agreement with competencies provided through the structure of the curriculum. For this, periodical meetings with representatives from the industry are organised.

The courses realised within the analysed engineering education programme are designed so that they combine teaching, learning and testing. The students' examination and assessment procedures are centred on the learning results and are announced to students in due time. The examination, teaching and learning are done in the context of links to previous disciplines, for the training of competencies and skills gained by the student at the end of the study programme.

The assessment is not just a means for controlling the quantity of information/knowledge acquired by the student, but especially of his ability to apply the knowledge in concrete learning situations, and also a criterion for curricular orientation, for the choice of methods, objectives, learning programme etc. The emphasis is on the forming of communication skills and abilities, of creative tackling of topics mentioned during the lectures, laboratory or project classes. The “Lucian Blaga” University provides learning resources, handbooks, treatises etc. for each study programme, through the libraries, in classical or electronic format, the access being free of charge. There exists also access to international databases.

For each course, the faculty members have teaching strategies in accordance with the study programme, with the study type and the predefined quality criteria. The syllabuses realised by the faculty members in charge of disciplines confirm this.

The “Lucian Blaga” University collects, processes and analyses data and information regarding the quality of education and of the students’ life within the university area.

#### **4. CONCLUSIONS**

From all the above-mentioned arguments, it results that the accreditation of the natural gases engineering study programme subjected to the analysis is fully justified, because both the “Lucian Blaga” University and the Engineering Faculty satisfy the requirements imposed by the current legislation.

The development of the industrial environment in Transylvania has as effects an increase of the demand for graduates in the domain of natural gases engineering.

Due to the demand for specialists in natural gases engineering on the workforce market, there appears also a special interest of the highschool graduates for this study programme, with the aim to easier find a well-paid and socially acknowledged workplace. The youths are very sensitive to the conditions on the workforce market when they decide to follow a certain professional path in a certain higher education institution.

We consider that, through the quality of the education offered in the Engineering Faculty of the “Lucian Blaga” University of Sibiu, there can be met the demands of the main customers – the youths, but also those of the society in its entirety.

#### **REFERENCES**

- [1] Dale B.G.: *Managing quality*. Blackwell Business, 1999
- [2] Manson S.G.: *The audit process: principles, practice and cases*. Bussiness press, 2000
- [3] Rowley R.: *Student services*. in *Higher Education Management. The Key Elements*. The Society for Research into Higher Education, O.U. Press, London, 1996
- [4] QS 9000:1998, *Quality system requirements*