Universitatea
POLITEHNICA
din Bucureşti
"UPB"

Nr. de înregistrare
_____

Agenția Română pentru
Asigurarea Calității în
Învățământul Superior
"ARACIS"

Nr. de înregistrare
_____

REPORT ON INSTITUTIONAL SELFEVALUATION OF UNIVERSITY "POLITEHNICA" IN BUCHAREST

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Bucharest
2007

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INTRODUCTION

Education and scientific research are important factors for economic growth in all countries, regardless of their level of technological development.

Human resources are a foremost condition regarding the innovative capacity of a certain country; on the other hand, technological innovations or adjustments are the driving forces of economic growth on the long term.

Recent theories, developed in the last 15 years, regarding economic growth demonstrate that educational yield is to be measured in technical progress. In countries located close to the technological barrier, education enhances the offer for potential research-workers, and consequently of potential innovative achievements in top technologies; alternatively, in less developed countries from the technological point of view, education may influence the adjustment of already known technologies to the local economic and social situation.

The higher education system must be fully oriented toward forming innovative capabilities.

The very concept of an **innovative university** is suggestive and considerable. This includes the notion of **entrepreneurial university** (including the co-notation of enterprise), implying a deliberate effort for **institutional construction** with specific **activities** and **targets**, involving considerable **energy** and **intelligence** costs. It seems that the university staff are the only ones who may represent the guarantee of the fact that academic values will govern the change; in turn, this fact may produce, enormous benefits in prestige, resources and development of the university.

The **innovative university** (in a similar manner as high technology companies) encourages and extends a **culture of labor**, implying that all **departments, chairs and the faculties** should also become **innovative units**, thus opening new programs and relations, furthermore identifying new complementary financing resources.

At the same time, as the new ideas spread into, or from the university, its symbolic ***cultural dimension*** gets a major significance in **cultivating an institutional identity and distinct reputation**.

It seems **that traditional practices are not adequate anymore**, being necessary to act towards a transformation for the better, even assuming risks and proving flexibility, while having a major commitment.

A. INSTITUTIONAL CAPABILITY

A.1– Institutional, administrative and managerial structures

University Politehnica in Bucharest is the oldest and most prestigious school for engineers in Romania; however, this institution is young by taking into account the age of the coming/hosted people, and it is always attracting and expecting young students to enroll.

Come from all over the country and whatever the condition! were the calling words of Gheorghe Lazar in ***"Instiintarea",*** through which, by ***"Opis domnesc",*** in 1818, the first Technical School with teaching in Romanian and the first Engineering courses were opened at the Monastery St. Sava from Bucharest; in 1832, this monastery was reorganize as St. Sava College.

October 1st 1867 represented the starting day of the "School of Bridges and Roads, Mines and Architecture" that became, not later than October 30th 1867, the "School of Bridges, Roads and Mines", with duration of studies of 5 years. Under the direction of Gheorghe Duca, by April 1st 1881, the institution was restructured and became the "National School of Bridges and Roads".

By June 10th 1920, the School Politehnica in Bucharest was founded, having four sections, namely: Electro-mechanics, Constructions, Mines and Metallurgy, Industrial Section. Starting with November 1920 the name has changed into POLITEHNICA from Bucharest.

By august 3rd 1948, the Polytechnic Institute from Bucharest was founded, having initially four faculties, and from 1950 hosting most of the actual faculties.

According with the resolution of the university Senate, from November 1992, the Polytechnic Institute from Bucharest has become the **University Politehnica in Bucharest** (UPB).

UPB guarantees for a high performance education, sustained by a complex research activity, according with the exigencies and by the tools of the modern informational society. UPB hosts 25 000 students enrolled in 13 faculties, the university education being structured on domains/directions of optional studies.

The studies are organized on three levels. The first level, *Bachelor in Engineering* lasts for 4 years/240 credits. The second level, *Master in Engineering*, lasts for 1.5 years and allows the graduating students of the first level to continue their studies and to specialize. The scientific devotion is confirmed by the graduation of the third level, *PhD in Engineering*, lasting between 3 and 4 years. UPB organizes post-university studies for continuous formation and/or professional conversion.

A teaching staff consisting in 1650 members (from which 245 university professors) are responsible for the teaching activity. Romanian is the teaching language in all the faculties, except for the Faculty of Engineering taught in Foreign Languages, where the lectures/courses are given in English, French and German.

Besides the teaching activity, scientific research is very important. This is developed within chairs, departments, or research centers. Moreover, some research institutes are already affiliated, or are about to be affiliated to our university. These institutes are actively involved in obtaining research grants and projects, by mobilizing their human and logistic resources and by approaching topics of fundamental and applied research. The scientific activity is strongly related to the profile of the faculties and it is sustained through a powerful and modern research infrastructure: teaching and research laboratories,

lecture halls, computational centers (from which a high performance center with a super-computer, with INTERNET/ INTRANET communication network etc.)

The libraries and computer centers existing in the university provide excellent facilities for documentation and study, including Internet access.

UPB has 28 university hostels, hosting 11500 students. The university campus has two university canteens, several pubs, students' clubs and discos.

Every year about 7000 students are receiving scholarships, especially based on professional performances, but also based on social criteria.

Foreign citizens intending to attend university studies at UPB need to present a "Letter of acceptance" obtained after an application to the Romanian Ministry of Education and Research. Application forms are available at the Romanian Embassy in the country of origin of each applicant. The candidate should also provide: photocopy or legalized copy of study certificates, legalized copy of birth document, medical certificate and legalized copy of the passport. The candidates could attend the curses in French, English, German and Romanian. In all situations, the communication abilities in the chosen language should be confirmed through a certificate, or by a language test.

UPB represents an active component of the international academic community, sharing the same moral, educational, scientific and cultural values. UPB is a member of several academic organizations such as: the Conference of European Schools for Education and Advanced Research in Engineering (CESAER), the Association of European Universities (EUA), the International Association of Universities (IUA) and it is strongly concerned by the international collaboration – more than 135 international, bilateral agreements until 2007 (see Annex). In the context of globalization phenomenon, UPB is devoting a big effort to enhance of international values exchange. In this aim, the students are involved in several programs of European schools such as SOCRATES (ERASMUS), or LEONARDO. Nevertheless, the university is actively participating at projects such as COPERNICUS, PECO, FP6 and FP7. The World Bank has funded several projects and development plans. Due to its well known reputation, UPB has collaboration programs with universities from 33 European countries, USA, Asia and Africa.

THE FACULTY OF ELECTRICAL ENGINEERING

With a history of more than 85 years, the Faculty of Electrical Engineering provides theoretical and practical education in the field of electrical engineering, through developing technical and informatics abilities for research, design and creation of dedicated software. The infrastructure consists in 42 laboratories with specific electric, electronics and informatics devices. The students have their own Computational Center, with INTERNET facilities, where they can prepare their homework, year projects, diploma and dissertation projects. Nevertheless, the faculty has a general technical library and three libraries of different specialized departments.

The main study domains of the faculty are: **Electrical Engineering**, having the sub-domains: *Electrical systems, Power Electronics, Instruments and Data Acquisition*; **Engineering and Industrial Management**, with the sub-domains *Economic engineering in electrical* field and **Applied Engineering Sciences** with the sub-domain *Applied informatics in electrical engineering*.

The education program corresponds to the European level, combining the tradition of the Romanian Electro-technical School with the actual trends in automatization and informatization.

Every year, 25-30 students of the faculty receive fellowships at different European universities, studies that are recognized by the faculty through the European credit system. The graduating students are offered by the faculty Master and PhD studies in modern topics.

Among the main research directions one may notice: the theory of the electromagnetic field and computational methods, the modeling of nonlinear magnetic materials, testing techniques and control digital systems, electrical measurements, biological and medical measurements, mathematic models of electrical machines, movement control, fractals theory etc.

FACULTY OF POWER ENGINEERING

The Faculty of Power Engineering was founded in 1950 and nowadays is the biggest between the eight similar faculties in the country. Since more than half century, the Faculty of Power Engineering has continuously improved and actualized its educational system according to the modern exigencies related to Power Engineering and considering the environmental and economical aspects.

The teaching staff is actively involved in research programs based on contracts of scientific cooperation with industrial institutions in the field. The faculty has hardware resources for research and the industrial laboratories of the faculty provide the students with a very useful direct contact with specific installations. Among the most important facilities should be mentioned: Thermal Plant with co-generation (including external platform for tests at real dimensions) or the laboratory for Hydraulic Equipment.

The educational program includes application, practical/experimental works and design activities. In the last 20 years, several new laboratories have been set up for teaching and research purposes as well as for industrial experiments. In this aim, Industrial thermal equipment, Modeling of the Power Engineering Processes, Hydraulic and Pneumatic equipment are only few examples.

The education domains are: **Energetic engineering** preparing specialists in: *Engineering of electro-power systems, Hydro-power, Thermo-power, Power Engineering and nuclear technologies, Management of energy*, **Engineering and management**, with the sub-domain *Economic engineering in electric, power engineering and electronic domains*, **Applied engineering sciences** with the sub-domain *Applied informatics for Power Engineering* and **Environmental Engineering** with the sub-domain *Engineering and protection of environment in industry*.

Among the research directions should be mentioned: the transport and distribution of electric energy, electromagnetic compatibility, non-newtonian fluids, heat transfer and heat exchangers, hydraulic and pneumatic equipments, turbulence in an open hydraulic channel, industrial ventilation and air conditioning systems, environment technology, mass transfer etc.

FACULTY OF AUTOMATICS AND COMPUTER SCIENCE

In 1963, the Polytechnic Institute from Bucharest has extended with a new direction of study: Automatics, whose development as part of the Faculty of Power Engineering was directed by the Department of Automatics, funded in the same year by Prof.. Corneliu Penescu, correspondent member of the Romanian Academy. The personality of Professor Penescu has imposed a direction of exceptional value in the evolution of the school of Automatics, leading at the founding, only three years later, of the Faculty of Automatics.

In 1967, the chair of Automatics was divided in two: the Chair of Automatics I and the Chair of Automatics II, and in 1969 the Chair of Computers has also been founded. Nowadays, these chairs still exist under the names of Automatics and Systems Engineering, Automatics and Industrial Informatics and Computers.

In forty years of existence, the Faculty of Automatics has imposed itself in the field of science and engineering of systems and computers, as a representative unit of education both in UPB, as in Romania, through the quality of the teaching staff, as well as due to the exceptional quality of its students and graduates. At the present time, the Faculty of Automatics and Computers has the same excellent reputation and has important links in both academic and scientific research with several schools in the country and abroad. The faculty prepares engineers in the fields of: **Computers and Information Technology** with the sub-domains *Computers and Information Technology* and **Engineering of Automatic Systems** with the sub-domain *Automatics and Applied Informatics*.

Between the research directions should be mentioned: Predictive, Adaptive and Robust Control for slow systems, Cognitive systems in virtual reality media; performing systems of direction of biologic processes and environment; advanced direction; information technology; robotics; intelligent systems of fabrication; technologies for materials with special properties; data acquisition etc.

FACULTY OF ELECTRONICS, TELECOMMUNICATIONS AND INFORMATION TECHNOLOGY

Founded in 1953, the Faculty of Electronics, Telecommunications and Technology of Information is one of the biggest and well-known faculties in the country, with more than 3500 students and preparing specialists in a wide range of domains such as applied electronics, telecommunications, devices, electronic circuits and devices, technology and reliability, physics - all these are the support of the informational society and the main engine of the word economic growth. All the lectures are aimed to respond the educational and practical necessities claimed by the actual conditions.

Due to the strong connections of the faculty with the industrial and business media in electronics, telecommunications and technology of information (***Infineon, Freescale, IBM, HP, Fujitsu-Siemens, Vodafone, Orange*** are only few examples), the graduating students have a broad range of technical and economical knowledge helping them to successfully answer the selection criteria requested by the companies.

The domains of university studies are: **Electronic Engineering and Telecommunications**, with the domains *Applied electronics, Technologies and telecommunication systems*; *Networks and software for telecommunications; Microelectronics, optoelectronics and nanotechnologies*, **Computers and technology of information** with the sub-domain *Engineering of information* and **Engineering and Management** with the sub-domain *Economic engineering in electric, electronic and power engineering field*.

The academic staff of the faculty has a long tradition in scientific research, proved by books and articles published in the most important international journals. The research activity requests the direct participation of the students and it is developed on multiple domains. The main research directions of interest in the faculties are: microprocessors and microcomputers, design/conception of VLSI circuits, devices and electronic circuits, systems of microwaves and optical fibers, digital processing of signals (images and voice), computer-assisted advanced modeling and design of electronic systems, hardware and software for data acquisition, networks and systems of telecommunications and data transmission, logic programmable systems, artificial intelligence, quality and reliability.

The faculty collaborates with foreign universities such as the National Institute for Telecommunications from Paris and the Federal Polytechnics Institute from Lausanne. The diplomas are recognized all over the world.

THE FACULTY OF MECHANICAL ENGINEERING AND MECHATRONICS

The Faculty of Mechanical engineering was founded in 1921 as part of the Faculty of Electro-mechanics, from which it has separated in the years ’50.

During the years, highly recognized professors have contributed to the formation of the students; among them, presidents and members of the Romanian Academy, national and international scientific personalities: Gheorghe Manea, Dorin Pavel, Gogu Constantinescu, C. Ionescu-Bujor, George Bărănescu, Traian Demian, Alexandru Seleşteanu, Constantin Aramă.

The faculty has as main study domains: **Mechanical Engineering** with the sub-domains *Systems and thermal equipments; Hydraulic and pneumatic machines and systems*; *Fine mechanics and nanotechnologies; Equipments for industrial processes; Devices for textiles and leather*, **Applied Engineering Sciences** with the sub-domain *Optometry*, **Mechatronics and Robotics** with the sub-domain *Mechatronics* and **Engineering and Management** with the sub-domain *Economic engineering in mechanics*.

Few of the main research directions are: the flow of fluids and heat transfer, engines dynamic, micro-tribology, high precision pneumatic systems, optic, optoelectronic and audio-video equipments, robotics and micro-robotics, biomedical equipments etc.

FACULTY FOR ENGINEERING AND MANAGEMENT OF TECHNOLOGICAL SYSTEMS

The faculty for Engineering and Management of Technological Systems has been founded in 1962 (the old name was Technology of Machine Building). However, we must mention that our chair "Material Strength" is based on the laboratory set up by A.Saligny, as soon as 1886.

Of course, at the present time, there are modern laboratories such as: Computer Aided Design, Assisted Production, Robotics, Non-destructive Defectoscopy, Data Acquisition, Ecology etc., where the hardware/software endowment give access for students for best systems for design, research and manufacture.

The education and research processes are sustained through modern materials and equipment, many being obtained from international projects (i.e. TEMPUS, ERASMUS, World Bank), or contracts with ministries, industrial units, some of them very prestigious ones (Siemens, MAZAK, Autodesk, National Instruments etc.).

Study domains are: **Industrial Engineering**, with the specialties *Technology of Machine Building, Machine-Tools and Manufacturing Systems, Welding Engineering, Quality Management and Engineering, Nanotechnologies and Non-conventional systems*, **Engineering and management**, with the specialty *Economic and Industrial Engineering* and **Mechatronics and Robotics**, with the specialty *Robotics*.

FACULTY FOR ENGINERING OF BIOTEHNICAL SYSTEMS

Starting with 1995, the old *Faculty for Agricultural Mechanics* turned into the *Faculty for Engineering of Biotechnical Systems,* as a result of extending its technical domain. Previously, the Faculty for Agricultural Mechanics (founded 1962) developed from the former specialty *"Agricultural Machines"* (1953) of the *Faculty of Mechanical Engineering*.

Nowadays, the faculty prepares graduates in conceiving, design, producing and maintenance of machines and equipment used for obtaining and processing of agricultural products, installations for environment protection, for maintenance of technical systems used in agriculture, food industry, biotechnologies as well as in management activities.

The students may choose for the following domains: **Mechanical Engineering**, with the specialty *Machines and Installations for agriculture and food industry*, or for **Environment Engineering**, with the specialties *Engineering of Biotechnical and Ecological Systems*, or *Engineering of Rural Sustainable Development*.

Within our laboratories the students and academic staff follow the main research directions, namely: mechanical vibrations, acoustics and noise control, rotor dynamics, chaotically systems, dynamic systems, vibrations in aero-elastic systems, elasticity and plasticity, modeling and simulation of biotechnical processes, CAD/CAE software for specific machines and installations.

FACULTY OF TRANSPORTATIONS

Faculty of Transportations has a long tradition (50 years) having its origins in the old Institute for Railways (founded 1948); the above mentioned institute merged with Polytechnic Institute of Bucharest in 1959, thus resulting the Faculty of Transportations.

Our graduates have competences in conceiving, building and running road vehicles, traffic safety, transport management, legislation in transport, electronics and tele-signals, intelligent transport systems etc. As we have kept equilibrium between fundamental technical education and specialty knowledge, our graduates have the possibility to demonstrate their professionalism even in other spheres of economic and social activities, public administration, trade, insurances, technical expertise etc.

Now the faculty has three domains of study: **Mechanical Engineering**, with specializations *Road Vehicles* and *Vehicles for railway transportation*, **Transport Engineering** with specialization *Transport and Traffic Engineering*, and **Electronics and Telecommunication Engineering** with the specialty *Tele-signals and Electronics in Transportation*. The four chairs from our faculty assure the teaching of these specializations.

The main lines for the research are: research-design in transport, design of informatics systems, interaction tyres-road, control and attenuation of noise and vibrations, automobile testing, chassis structure, automatic transmission gear, electronics for transport etc.

FACULTY OF AEROSPACE ENGINEERING

Higher education lectures in Aviation have been inaugurated in 1928, when Professor Elie Carafoli gave his first course on Aeronautics at Polytechnic School in Bucharest; furthermore, he has built the first aerodynamic tunnel in South-East Europe (1931).

Between 1933 – 1971 the topic "Aviation" has been taught in Polytechnic School; however, in 1971, the Faculty of Aerospace Engineering has been founded, having 100-120 graduates each year.

The domain of study is **Aerospace Engineering**, having the following specializations: *Aerospace Constructions, Propulsion systems, Equipment and Installations for Aviation, Aeronautic Engineering and Management.*

Numerous scientific research contracts, carried out in internal and international partnerships assume the existence of mobility programs for students; many themes are also used to perform diploma projects, dissertation works or Ph.D. theses. Among the partners we have to mention Duke University, Miami University, Nancy University, Liege University, Patras University, Aerostar S.A., Turbomecanica S.A., Aerofina S.A., Romanian Civil Aeronautic Authority.

Since 1996, Romania is a EUROCONTROL member, participating to several programs (in the frame of 38 working groups) meant to modernize the services within civil aviation traffic. Other aviation programs involve Romania as producer of landing trains, hydro-pneumatic equipment, motors, equipment for radio-navigation, various spare parts (for BOEING B737, B757, CANADAIR CL-415, VIPER 632-41, 632-41M, 633-47, SPAY 512-14 DW, all under Rolls-Royce know-how); we also

manufacture helicopters (IAR 330 L PUMA, IAR 330 PUMA SOCAT, IAR 316 B Alouette III,) and carry out maintenance operations for BOEING 737, 707.

FACULTY OF MATERIALS SCIENCE AND ENGINEERING

The traditions of material science and engineering education are strongly related to the setting up and development of metallurgy in our country, at first in the archaic way (iron age, bronze age) and then in the classical, and after 1729, modern structures.

The modern requirements of engineering training in the field of the new materials production needed the change of the Metallurgy faculty into Materials Science and Engineering faculty, both in form and content, in 1990.

Thus, the study and design of advanced materials as composite materials, poly-phase materials, metallic glass, metallic and ceramic powders, shape memory effect materials, ultra light materials, magnetic materials, antifriction materials, super-plastic materials, etc. have been introduced in the university curriculum.

This faculty has three fields of study, namely **Materials Engineering**, whose specializations are *Materials science, Metallic materials elaboration engineering, Metallic materials processing engineering*; **Applied Engineering Sciences**, whose specialization is *Medical engineering*; **Engineering and Management**, whose specialization is *Economic engineering in chemical and materials industry*; and **Environmental engineering**, whose specialization is *Environmental engineering and protection in industry*.

Lately, university research on materials, carried out in faculty research centers, has a strong impact on the professional practical training of future engineers, besides its beneficial role for the materials field (new techniques implementation, technologies, materials and improvement of the existing ones). The following research areas can be mentioned: mathematical modeling of plasma/solid body interface processes, structural modeling and simulation, fundamental and applied research of manufacturing technologies for metallic materials, amorphous materials and metallic nano-crystal matrix in composite materials, radioactive metals, and metallurgic products recycling technologies.

FACULTY OF APPLIED CHEMISTRY AND MATERIALS SCIENCE

The Faculty of Applied Chemistry and Materials Science traces its roots back to 1867, in the former School of Bridges, Roads and Mines, when courses taught by Professor Emanuel Bacaloglu have been introduced for the first time. In the same place, Academician Alfons Saligny lead the chemistry laboratories from 1886 to 1903, and was followed by Grigore Pfeiffer. The young Emilian Bratu, Costin Nenitescu, Serban Solacolu, hired between the two world wars, became famous professors, academicians, school founders.

In a natural way, the faculty has developed new specializations, laboratories and research centers corresponding to scientific and technological development. At present, the faculty trains engineers in various specializations in the chemical industry. Thus, the faculty has three fields of study: **Chemical**

engineering, whose specializations are *Inorganic substances and environmental protection engineering*; *Science and engineering of oxide materials and nano-materials*; *Chemistry and engineering of organic substances, petrochemistry and carbochemistry*; *Polymers science and engineering*; *Food chemistry and biochemical technologies*; *Engineering and informatics of chemical and biochemical processes*; **Environmental engineering**, whose specialization is *Environmental engineering and protection in chemical and petrochemical industry*; and **Engineering and management**, whose specialization is *Economic engineering in chemical and materials industry*.

Among the main research directions we have to mention mass transfer in multiphase systems, modeling of phase equilibriums at high or low pressures, nano-materials, composites, biomaterials, modeling of solid oxides, adsorption on charcoal, polymers with porous structure, waste water treatment, crystallization etc.

FACULTY OF ENGINEERING TAUGHT IN FOREIGN LANGUAGES

The Faculty of Engineering taught in foreign Languages (FILS) is an engineering school, where all the teaching entirely takes place in foreign languages; there are three branches, namely English, French and German. It has been set up in 2002, by transformation of the old Department for Engineering Science (founded 1990).

The aim of the faculty is the formation of engineers with a solid professional background, working for the development of Romania, and making the interface with the foreign investors. Furthermore, the faculty is open to foreign students, who are thus not compelled to learn Romanian prior starting their studies.

The main domains are: **Electronics and Telecommunications Engineering**, with the specialization *Applied Electronics* (English, French, and German), **Computers and Information Technology**, with the specialization *Information Engineering* (English, French), **Mechanical Engineering**, with the specialization *Mechanical Engineering* (English, French), **Chemical Engineering**,, with the specialization *Chemical Engineering* (English, French), **Materials Engineering**, with the specialization *Material Science* (English, French) and **Engineering and Management**, with the specializations *Economic engineering in electric and electronics field* (German} and *Economic engineering in Mechanical domain* (German).

FACULTY OF APPLIED SCIENCES

The Faculty of Engineering Sciences has been founded in 2005, based on the joint proposal made by the Department of Mathematics and the Department of Physics.

We provide a fundamental multi-disciplinary training (based on Mathematics, Physics, and Informatics), as well as a general engineering and managerial, theoretical and experimental education; we provide psycho-pedagogical and socio-human preparation and offer the possibility to learn two foreign languages. Education is oriented so that to solve the new challenges, with competences in the engineering specializations of the future (Mathematical and Physical modeling, Optics, Nano-electronics, Econo-physics). This approach allows continuous and flexible self-improvement, adapted to the world labor market and corresponds to the increasing need for expert-engineers in modeling and

simulation for High-Tech and IT companies, Internet networks, media, research, management, banks, insurance companies, administration etc.

The faculty has three Research Centers and 19 laboratories (Lasers, Optoelectronics, Microscopy, Holography, Optical processing of information, Liquid Crystals, Materials, Chaos and Non-linear dynamics, Plasma, Computational Physics, Nuclear Physics, Computer architecture and data bases, Computer programming and operation systems, Computer networks, Artificial intelligence, Numerical analysis, Computer aided design, Computer graphics, Image processing). Among our 215 academic staff, many are laureates of the Romanian Academy; quite all of them are implied in cooperation programs with research institutes or universities from home and abroad.

The program of studies is **Applied Engineering Sciences**, with the specializations *Mathematics and Applied Informatics in engineering* and *Physics Engineering*.

A.1.1 Mission, objectives and academic integrity

A.1.1.1 Mission and objectives

The mission assumed by University POLITEHNICA of Bucharest is thought as a junction of education through professional formation, of scientific research by producing know-how and of innovation, all being the main aims of a knowledge-based society.

University POLITEHNICA of Bucharest assumes the concept of **innovative university**, both regarding the **education of human resources** (conditioning the innovating capacity of any country), as well as with regard to **scientific research**, producing **knowledge** and technological innovation, crucial for economical growth of the country.

At the same time the **cultural dimension** of the university keeps its major significance in promoting the institutional identity and distinct standing.

Producing knowledge, mainly through scientific research, **education and professional training, dissemination using information technologies, the use of technological innovation,** represent the four elements defining the essentials of university.

Europe requires universities able to design and optimize the processes leading to the knowledge-based society, to reach the objectives established for a sustainable development, for a higher economic and social cohesion, as set up by the **European Council in Lisbon (2000) and Barcelona (2002).**

At the Conference of Education Ministers (Berlin – September, 2003) the fundamental role played by universities and student organizations in development of **European Higher Education Area (EHEA)** was fully recognized; the following priorities were noticed:

- Improvement of the quality in higher education at European level, by developing some common criteria and by assuming the responsibility of the national academic systems;
- Structuring the studies by approving a cycle-based system, whose implementation has begun in 2005;
- Promoting the mobility of students and academic staff, thus contributing to the establishing of EHEA;
- Mutual recognizing of studies by adopting a system easy to understand, by implementing the Lisbon Convention regarding mutual recognizing;
- Achieving a partnership with the students for decision-making;
- Transforming long life learning (LLL) into reality by the contribution of academic institutions;

These priorities have also been assumed by University POLITEHNICA of Bucharest is setting its strategic goals for the period 2004 - 2008.

To meet the challenges, the educational policies implemented in University POLITEHNICA of Bucharest are to be articulate and coherent; their objectives must be shared by the academic community and the effort has to be a continuous one, explicit decisions, build up with intelligence and equilibrium, systematic and simple evaluation, and last but not least a responsible management.

At the same time, education in University POLITEHNICA of Bucharest has the following operational goals:

- producing a quality education both in the first university cycle, as well as at master or doctoral level;

- providing top fundamental researches, accountable by the number and impact coefficient of scientific publications;
- assuring the capability to be involved in applicative research, towards industrial development;
- ensuring the capacity to always re-generate by selection of best projects, students, research teams, for getting the best future professors;
- openness towards the community, participating by the expertise furnished to set up strategies and politics for regional, national or European development;

In the frame of ever increasing internationalization of education process, the success is secured by the participation of all actors, namely students and academic staff.

Contents of studies

University POLITEHNICA of Bucharest has redesigned all its curricula so that to assure the competencies defining the professional career, in agreement with the requirements of labor market, and, in general with the priorities produced by the accession to European Union and international standards. In this respect we have taken the following steps:

- The content of all branches of learning have been oriented toward formative priorities and development of creativity;
- Permanent updating of the scientific content of all branches of learning;
- Increasing the emphasis of disciplines containing comparative approaches and international perspective;
- The content of all branches of learning would present the specific problems regarding economic integration of Romania in European structures;
- Also the syllabuses of all fields are to be oriented towards methods, operations and techniques so that to enhance the practical feature of knowledge, headed for acquiring the notions of project management.

Furthermore, in each faculty and in every field:

- Curricula plans were inter-disciplinary correlated and validated in all university
- The quality of lectures has been improved by introducing up-to-date information;
- We have stimulated the interest of students toward individual home work and research, by increasing the weight of these activities within the due evaluation;
- Inter- and multi-disciplinary profiles have been extended, so avoiding narrow specialization; this fact will ease for graduates, the task of finding an adequate job;
- Practical for seminaries, laboratories or projects has been augmented;
- Education process is now more linked to the real needs of market economy;
- We have increased investments in equipment for a normal advancement in academic and scientific activities;
- Complementary education in the field of communication, entrepreneurship, marketing and career development has been assured through modules of optional disciplines.

University POLITEHNICA of Bucharest is in a process of modernization of teaching technologies by:

- introducing IT methods in teaching and evaluation system;
- extension of computer assisted educational system to various disciplines;
- the increasing importance of themes and disciplines for which the practical work is carried out in micro-teams;

- development of didactic and pedagogic training, for the academic staff, combining the experience and the personal results with the new directions and orientations manifested on European level, as well as adapting them to the local conditions;
- increasing of flexibility regarding the horizontal mobility of students between different fields, accompanied by the recognition of previously obtained credits;
- endowment of laboratories with a minimum necessary equipment, for practical works;
- the increase of current preoccupation for inviting foreign professors at our university, in order to teach in front of our students and professors the latest topics, in conditions of reciprocity;
- the concern for the improvement of the content in students textbooks, by publishing up-to-date teaching material at the highest scientific level;
- increasing the significance of individual training of the students, based on homework, projects, etc.

For studies within the second and the third university cycles, namely, master and doctoral levels, University POLITEHNICA of Bucharest has as its main goals:

➧ ***For master studies:***

- development of interdisciplinary master programs;
- sustaining of some master's programs in partnership with economic enterprises, other public or private institutions, with universities from our country or from other countries (creating a "joint curricula" and offering "joint degrees" to the graduates);
- the flexibility of the master programs and their adaptation to the existing demand on the labor market;
- opening of the master programs at the top of scientific fields.

➧ ***For doctoral studies:***

- organizing the doctoral schools in the performing research fields within the university;
- development of the joint doctoral studies, with the participation of Romanian and foreign universities;
- coming up to the top domains and/or interdisciplinary fields.

Continuous formation and LLL

Besides the fundamental mission of initial formation, University POLITEHNICA of Bucharest offers continuous formation (LLL). This request includes the formation of new competencies on the top scientific and technical fields and the continuous renewal of the competencies acquired in the process of initial formation.

For the continuous formation we are trying to achieve the following objectives:

- a modular, flexible system, compliant with the demands and the possibilities of students and/or of economic agents;
- an open-distance educational system, using the information technologies, mainly through the RoEduNet network;
- the diversification of the education fields, of their contents and of the methods used, in accordance with the target groups;
- assuring flexible, access conditions;
- opening towards industry or to the personnel development needs, taking into account the major society problems, concerning the sustainable development, the risk management, the quality assurance, the local and regional development.

Continuity in the evolution of the university requires and implies the fulfillment of its strategic mission, assumed in its quality of institution leader for the higher technical Romanian educational system.

Thus, the concerns of all members of the academic community within our university are getting intensified in the following directions:

- a qualified support for the re-organization and university reform processes in Romania;
- the systematic function of University POLITEHNICA of Bucharest as a nucleus of formative, conception and consultancy competencies, in the relations it develops with other public and private organizations, with the public administration, with the decision elements and with the civil society;
- University POLITEHNICA of Bucharest must have an active role in the inter-university cooperation at regional, national and European levels, by continuing the existent co-operation and the developing of new ones, grounded on the sustainable partnership principle, in a bilateral and multilateral frame, by integrating in the European Association of Universities (EUA).

University POLITEHNICA of Bucharest has a **dynamic position in the inter-university cooperation at national and international level**. Using also the rector's position as President of the National Council of Rectors, University POLITEHNICA of Bucharest has been open to the initiation and developing of partnership with private or public Romanian universities. The partnerships aimed at the teaching activity implying cooperation in sustaining some university degree programs, with the transfer of good practice examples, or they aimed at the activity of scientific research, elaborating some projects in cooperation, preparing works or scientific conferences that lead to a better use of existing equipment and of scientific expertise in every partner university.

The partnership has also aimed at the common organization of professional courses for students, joint doctoral studies in faculties or fields, the organization of sport events, etc.

The dissemination towards the Romanian universities of information, decisions and EAU documents represents a permanent preoccupation.

Regarding the international cooperation, University POLITEHNICA of Bucharest has as strategic goal to become part of The European Higher Education Area. As a result, in addition to the alignment to European standards, University POLITEHNICA of Bucharest concluded over 130 mutual agreements with other foreign universities.

These partnerships include the development in cooperation of some programs for university degrees, master or joint doctoral studies, as well as academic exchanges of students and/or professors, within the framework of European programs (i.e. Erasmus, Socrates, Leonardo, etc), or by direct exchanges.

Renewal and flexibility centered upon priorities

- the assimilation in the spirit of its own values and traditions of the European and international standards, concerning the content and the method of the teaching act and the knowledge evaluation;
- advanced information technology and the absorption of its principles in the content of all the competencies of the educational process.
- the sustained increase of the professional character of the university and post-university preparation by developing at the future graduates specific abilities and competencies of technical diagnosis, of decision preparing and assisting, of crisis and changes administration, of involvement and participation at complex projects, of fast integration on the labor market.

The engagement for reaching international university standards

- The development and the strengthening of university competencies in the field of virtual education;

- The strengthening of the university statute as a standard-institution in the process of creating specialists in the technical and/or technical-economic fields;
- The reinforcement and the development of co-operation, both with universities with the same profile from other university centers as well as with European and world universities;
- The request of a quality improvement system of the educational process;
- The university assertion in the technical fundamental research and in the improvement of research applied in the field.

A.1.1.2 The reinforcement of the spirit of academic community

The academic integrity, the strengthening of the character of academic community, is achieved through promotion of basic principles, such as:

- the cultivation of the **transparency principle** in the relationships with internal and external partners;
- the promotion of an **organizational culture based on performance and probity**;
- the stimulation of some **consultative, flexible methods or work techniques**;
- the development of the **partnership relations with public and private organizations** for supporting the process of fast and dynamic integration of graduates in the social-economic life, by identification of a suitable employment, according to the studies graduated;
- discouragement and **total elimination of all forms of corruption**;
- **the investigation of change tendencies at social-economic level and the flexible, fast adjustment to new demands**.

The academic integrity is assured by the above mentioned principles for promotion, and also by the independent performance of the **Commission of ethics and academic integrity**, and the very existence of a **Code of ethics and academic integrity**. The Commission of ethics and academic integrity works on the basis of a personal regulation, and the Code of ethics and academic integrity is approved by the Senate of university and can be found on the University web site.

The Commission of ethics and academic integrity receives for solving the allegations, debates the cases in discussion, recommends solutions and informs the Senate of university on the debated and solved cases.

The university has a service of **internal audit**. The internal audit is made on the basis of a **yearly audit plan** that aims at all the main domains of university activity. On the basis of the audit plan, for each audited field an **audit report** is to be drawn up, discussed in the Senate Meeting and which is always accompanied by **proposals for improvements**, also containing terms for application.

The audit plans for 2006 and 2007 are also presented in ANNEX.

With the help of the measures proposed in the audit report it is meant the increase of performance for the audited fields and compartments. The next audit increases the performance level established by the previous one.

Human resources represent for any institution a decisive element. As a result, the promotion and the continuous progress in human resources are major objectives. For reaching these goals, university tries to achieve:

- the promotion of an organizational culture based on performance and probity;
- the dissemination and the support of academic excellence, using financial and/or non-financial rewards;

- using a system of periodical assessment for professors' activity through self evaluation, colleague evaluation and students evaluation;
- encouragement for professors mobility;
- the involvement in getting documentation scholarships on concrete objectives, such as writing up textbooks, introducing new applicative works, designing new disciplines, etc.;
- flexibility in the way of using time by the academic staff;
- convincing the most performing young people toward an academic career;
- improving the conditions for getting study scholarships, master scholarships, doctoral and post-doctoral grants, research scholarships, for students and academic staff;
- promotion of academic exchanges between UPB and partner universities in the country or abroad;
- participation of the auxiliary teaching and non-teaching personnel at programs of continuous formation.

University POLITEHNICA of Bucharest promotes a continuous dialogue with students, as well as the accomplishment of an academic partnership, by:

- cooperation and sustaining of the clubs and the micro-clubs organized by students;
- establishment, at university level, of a psycho-pedagogic consultancy centre and of career orientation;
- sustaining the activities of students' organizations, for the development of convenient projects for the students from the university;
- providing civilized life conditions in *Regie* and *Leu* Campuses and of a climate adapted to the students' demands

A.1.1.3 Accountability and public responsibility

University POLITEHNICA in Bucharest has assumed accountability and public responsibility for:

- Curricula offered;
- Sustainable development of university;
- Opening of university toward economic and social milieu;
- European integration of the university, by sustaining academic and research cooperation;
- Keeping communication with the main institutions, partners from economic and social environment, with other universities from home and abroad;
- Equal promoting of interests of faculties, departments or chairs from UPB;
- Observing the legislation in vigor;
- Strong collaboration among faculties, departments or chairs, within the university;
- Constant sustaining of initial or developing projects, approved by the Senate vote;

- Starting up new projects in various fields - academic development, research, improval of logistics etc;
- Keeping an academic climate, favoring collegial collaboration.

A.1.2 Management and administration

A.1.2.1 Management structure

In University POLITEHNICA of Bucharest, the structure of management is organized according to the legislation in vigor. Election of University management is carried out by observing the law 128/1997 (Statute of Education Personnel), of law 84/1995 (republished), and Minister's Orders regarding elections for the management of universities; furthermore, elections are organized according to University Charta and "Election Regulations" (all being public documents).

Election mechanisms comply with the principles of academic democracy and representation quotas, as defined by the law and University Charta. Candidates for the position of Dean and/or Rector are compelled to present and publicly sustain a managerial plan, describing the strategic aims proposed.

All managerial structures contain students; their number is that established by law. University Charta and "Election Regulations" describe in detail the procedures for the election of student representatives by the students themselves.

The management approach is based onto consequent promotion of the following principles:

- „open-door" policy;
- „with an open mind toward colleagues and the managerial team";
- trust in people;
- assuming the responsibility for managerial endeavor.

A.1.2.2 Strategic Management

In its managerial activity the administration, team from University POLITEHNICA of Bucharest promotes:

- *realism and dynamism in all actions,* by taking due account of legal and institutional aspects related to the right of entry of University POLITEHNICA of Bucharest in EHEA;
- *creativity and flexibility* in the managing manner, by promoting and assisting innovative solutions, in order to increase the quality and efficiency of all specific activities in faculties, departments or University compartments. All action proposals are promptly analyzed by the managerial team, together with their authors, so that to appreciate their intrinsic value and/or applicability;
- *coherence of all steps taken*, so that all actions are to be sub-summated to the fundamental goal of academic community, as defined within the university;
- *focusing all preoccupations on the quality* of activities concerning educational formation, scientific research, publishing, services offered to students, or to other users, evaluation of quality in education and research;
- *the efficiency of managerial process*, by implying all decisional factors and echelons (deans, permanent working commissions within the Senate, rector, vice-rectors, scientific secretary of

Senate, general administrative manager, directors of research centers, chief registrar), academic staff, students, auxiliary personnel, for the analysis and decision making in all activities, according to their competencies as set up by the functioning regulations within University POLITEHNICA of Bucharest;

- *transparency* in setting the strategic goals, as well as in adopting and operating the due measures for operative management, by opportunity analyses and by informing the interested persons on the solutions found;
- *frankness* in the dialogue with all interested groups, orbiting around the university, consisting in the desire to discuss, negotiate and cooperate with partners from university and non-university environment, from home or abroad.

University POLITEHNICA of Bucharest has set its strategic plan for a duration of four years. Each year operational calendars are conceived (see ANNEX), taking into account national and international conditions and evolutions; these plans are to be approved by the university Senate.

Within the managerial process, a chief preoccupation was to increase the degree of commitment in all decision-making echelons (deans, directors of research centers etc).

We have to mention **the growth of decisional autonomy in all faculties, departments and research centers,** as an accomplished fact.

Decisional autonomy both for the university as a whole, but also at the level of subsequent structures has been assumed simultaneously with assuming public responsibility for the initial measures.

Transparency within operative management has been assure, among others, by the permanent presence of syndicate leaders to operative meetings of "Senate Bureau"; also, the decisions taken are conveyed to the academic community through Senate.

Furthermore, we have extended the participation of deans in the process of important decision-making, before being presented to the Senate to be approved; it is stated that all members of the academic community may participate in running all administrative processes.

For instance, all commissions for auctions organized for procurement of equipment, works, products, do have members from chairs, faculties, departments, research centers etc; in this way, university interests are better sustained a improved selection within the auction may be achieved. The same is valid for the reception commissions for products, services or equipment; the participation of representatives from different university structures eases the final appreciation on the quality by which the contracts have been fulfilled.

A.1.2.3 Efficient administration

Administration in University POLITEHNICA of Bucharest obviously, represents a complex process; its main principles (based on a flexible and efficient management) are:

- continuity in evolution of the university;
- flexibility, oriented according to priorities;
- commitment so that to reach international university standards;
- strengthening the spirit of a true academic community;
- ending up the proposed goals, taking into account the term foreseen.

The organizational scheme of University POLITEHNICA of Bucharest (see ANNEX) has been adapted so that to guarantee a performing management.

The managerial team is deeply preoccupied with introducing and improving IT, both in the administrative services, as well as in the teaching manner. So, University POLITEHNICA of Bucharest has a vice-rector charged with introducing information technology at all levels. In turn, every faculty has his own responsible person for IT development.

A.2 – Logistics

A.2.1 Patrimony, endowment, financial resources allocated

A.2.1.1 Spaces used for education, research and others

In University POLITEHNICA of Bucharest there are undergraduate students (bachelor - "license"), as well as students enrolled in Master or PhD programs.

University POLITEHNICA of Bucharest has the biggest university campus in Romania. Within the campus, each faculty, each program of studies, each research activity has its own room, so that a given activity may take place according to national and international standards.

The rooms for courses or seminaries are used for all forms of studies: their employment is carried out at the level of the whole university. On the contrary, the rooms for laboratories are used at the level of faculty by the corresponding chairs.

University POLITEHNICA of Bucharest owns 28 hostels (14 000 places), distributed in two Complexes (Regie and Leu) as well as two canteens.

Student accommodation in hostels takes place in a de-centralized way (at the disposal of faculties); the housing is completely "informatized" with the intention of assuring the needed transparency.

University POLITEHNICA of Bucharest has nowadays six research "platforms", used in interdisciplinary domains, thus integrating various research schools within the university. They represent a major step forward marking an important increase of the research h potential, in fields thought to be compatible at European level.

A.2.1.2 Endowment

University POLITEHNICA of Bucharest has an significant program of investments (see ANNEX).

Laboratories have now the endowment presented in self-evaluation reports for each program of studies.

Updating the laboratories is seen by each faculty and rectorate, as one of the most important goals.

We must underline that in 2006, each faculty has got two new laboratories for disciplines contained in the "common trunk" of the curriculum.

This project continues in 2007 for specialization disciplines; for the refurbishment of these laboratories we have already started the procedures for acquisitions.

An important part of financial resources coming from scientific research contracts are used for buying equipment necessary within university laboratories; obviously, a better equipment increases the performance in research, and accordingly the reputation and prestige.

The equipment obtained from these funds are used also in the training process, especially for carrying out diploma and dissertation works, or within doctoral theses. Moreover, University POLITEHNICA of Bucharest is currently engaged in the endowment of the already mentioned "research platforms".

In the last three years, within the Hostel and Canteen Complexes (Regie and Leu), 19 out of 28 hostels have been refurbished; other 7 hostels are to be refurbished starting with the summer of 2007 (The "Regie" Complex has been built between 1961 and 1982).

New reading halls, suitably equipped are now in development for each hostel. Also, in 2006 in all hostels from "Regie" Complex have been endowed with cables, thus assuring free Internet access for each room.

University POLITEHNICA of Bucharest has under construction its new **POLITEHNICA Library**, offering 18000 m^2 useful space; in the end, besides the space for books and lecture halls, the building will contain a Conference Center.

The university has in refurbishment and/or consolidation the buildings A and F from Polizu, and EG and JH from the "New Site", respectively; these constructions include lecture and seminary halls, as well as laboratories.

We have also to mention the rehabilitation of the most part from the thermal network; the last phase of this effort will take place in 2007, the thermal Plant will be completely refurbished. In this way the university will become an independent consumer, and perhaps even a provider for other consumers in our zone.

A.2.1.3 Financial resources

Financial resources for endowment (in 2006) were:

- Resources from the budget (34.6% out of total expenses);
- Own incomes (23.3 % out of total expenses);
- Sponsorships (1.9 % out of total expenses);
- Research contracts (40.2 % out of total expenses);

A.2.1.4 System for grant allowance; other forms for material support for students

University POLITEHNICA of Bucharest provides grants for students, in agreement with the guidelines in vigor (laws, government decisions, order of minister of education); the methodology for grant allowance in described in detail in our own set of rules (see ANNEX).

Grants are given from budget allocations but also from university resources. The rules for grant allowance in previously discussed with the students, approved by the Senate and may be periodically revised.

Based on its own resources, University POLITEHNICA of Bucharest offers grants, prizes, and supplementary supports students participating in Socrates program; also, the university provides prizes

for “first one in his/her class” or grants for students engaged in social activities at Regie or Leu campuses.

Grants from internal resources represent around 20% from the total fund of grants.

B. EDUCATIONAL EFFICIENCY

B. 1 – Content of curricula

University POLITEHNICA of Bucharest organizes in its 13 faculties:

- undergraduate studies (Licență) in 15 fields with 66 curricula (distinct specializations);
- M.Sci. studies in 15 fields with 97 curricula (distinct specializations);
- Ph.D. studies in 19 fields.

All studies and their corresponding curricula are approved either by Government decisions or orders of the minister of education. The content (syllabus) of each program of studies is designed at the level of faculties and chairs.

Likewise, the general and specialty competences (corresponding to each program of studies) are set up by the Dean's Council and finally approved by university Senate; the same is valid for the standards regarding education in fundamental topics.

Each chair (through the professors assigned to a given discipline) elaborates "Subject Identification"; there are stated the competences resulted from a given discipline, its content, the evaluation procedures, and the number of credits, as well as bibliography.

The content of each program of studies have to be presented in the self-evaluation reports.

B.1.1 Student admission

B.1.1.1 Principles of the recruitment policy

University POLITEHNICA of Bucharest makes public its offer regarding education programs, simultaneously wit the beginning of the academic year, by:

- the university site;
- periodical publications (booklets, pamphlets, journals, guides for admission in higher education institutions);
- presentation of the university in secondary schools;
- educational fairs and exhibitions.

University POLITEHNICA of Bucharest promotes selection criteria based on **scholar performances and the equal-chances principle**.

Communication with the interested parties is permanent.

Starting with the academic year 2006/2007, the interested candidates may apply for on-line enrollment; the validity is subsequently validated by presenting the due documents.

B.1.1.2. Admission procedures

Admission for studies in University POLITEHNICA of Bucharest is open to graduates from secondary schools, having a baccalaureate diploma, for "licență"; admission to M.Sci or Ph.D. studies implies a previous engineer diploma.

Admission in each cycle of studies is controlled by criteria established by university Senate, within corresponding regulation guides.

B. 3 - Scientific research

B.3.1 Research agenda

B.3.1.1 Programming of research

The scientific research, traditionally, is one of the components of the activity that, without doubt, offered national and international visibility and prestige to University POLITEHNICA of Bucharest. It represents the main process of knowledge and innovation that makes possible the dynamics of the essential values of the education activities of our university.

That is why, the strategic orientations of scientific research at all levels- departments, research centers, faculties, university- corresponds to the fields and the specializations of the technical university and post-university education present and provisioned.

The general objective that we find in all the long term strategies of the Senate of UPB and of the Councils of faculties is represented by the stimulation of science progress, of technology and innovation in Romania, for the raise of economic attractiveness with an emphasis on the continuous professional training, on the improvement of the research infrastructure, the articulation of major programs of research, the promotion of organizational excellence, the improvement of the social life quality and of the public awareness of CDI field in the context of European Union accession and of the globalization, as economic and social phenomenon.

The national priorities to which the CDI activities from our university are subordinated, through the conceived strategies, address to the technologies of the information society, energy, health, environment, transportation and the territory fitting out, security and food safety, biotechnologies, the processes, the products and materials, the fundamental aspects of the social-economic life.

This is the reason for which we appreciate that the research programming is integrated within the national priorities, and the accomplishments at national level are significant. The Synthesis of research Reports presented in the Senate of UPB regarding the research activities in 2004, 2005, 2006, and the Reports to CNCFIS regarding the financing indicator IC 6 in 2004, 2005, and 2006 which are presented in the ANNEX constitute convincing arguments of the research relevance on national level.

The involvement of the university research potential in accomplishing scientific research projects with international financing (PC 5 and 6, Leonardo da Vinci, Marie Curie, NATO, Phare, Erasmus, COST, EUREKA, bilateral agreements, etc) had the role of placing University POLITEHNICA of Bucharest on the first position in Romania as number of won projects and also as attracted money. It is enough to mention that the main fields of the won projects in PC 6, for example (37 projects, out of which 5 as coordinators) cover the entire 7 priorities of PC 6, with a special accent on the information technology, nanosciences- nanotechnologies and special materials, knowledge based society, energy-environment and sustainable development.

Adding to the participation at the European scientific research, that the reports in the ANNEX present in detail, the international visibility of the research results mentioned in articles rated ISI (192 in 2004, 249 in 2005, 291 in 2006), books and monographs published at well-known international publishing houses, scientific communications at the most impressive international conferences and congresses, invention patents deposed in foreign countries, we are right in saying that the UPB research performances are written down with prestige in the international research field.

The constant participation of our university professors to ascertain the strategies suitable to the research programs from PNCD II and PNCD III and to the themes of CNCSIS grants (within the commission of Engineering Sciences) represents a supplementary reason for the participation at setting up the research strategies at national level.

B.3.1.2 Carrying out research

The UPB research has human resources - 1592 academic staff, out of which 520 professors and 340 readers, 258 doctoral supervisors (at 2356 doctoral students), of which 678 in the system with frequency, 47 permanently employees in research and another 679 on determined period, creating at the end of 2006 a total of 1902 person x month- material resources (in the 62 chairs/departments and the 38 research centers) that registered a significant raise as a result of the bigger and bigger resources attracted by the research activities, of 58,6 million RON in 2006, and by the financing obtained in the six “platforms “of formation-research.

The operative management of research activities has been assured by the UPB direction DMACS and by the management of the research centers under the coordination of the Vice-Rector for scientific research and of the General Administrative Manager.

The synthesis of the yearly reports presented in the Senate of UPB (see ANNEX) records synthetic indicators that reflect the participation in research activities. In the report from 2005, we have used indicators such as number of grants or PNCD I projects (or their value) per center (faculty), or per professor or reader; likewise we have reported the number of AT and TD grants to the number of lecturers or assistants. Other indicators are, for instance, the number of contracts directly financed by economic agents divided to the number of professors and readers, or the value from research contracts reported to the total monthly wages. The scientific value may be estimated by the number of ISI papers per professors and readers. We ay say now that all these indicators, calculated in every faculty/department had simulative effects. Also, the report for 2006 shows important qualitative and quantitative increases by comparison with the report for 2005.

Doubtlessly, the commissions for internal endorsement brought their contribution in improving the research reports; in a similar manner, the Senate Council for Scientific Research has oriented many research endeavors towards multi-disciplinary research, especially inter- and trans-disciplinary ones (i.e. such efforts were made on the above mentioned "platforms").

The **use of IT in all research activities** has been manifest, especially with regard to the running of CNCSIS projects, as well as for research "platforms".

As shown before, in UPB there are several research "platforms"; we have assured a transparent access to all information regarding acquisitions carried out within every "platform", namely:

- QEVMAT – Computing equipment;
- QEVMAT – Laboratory apparatus and installations;
- QEVMAT – Defectoscopy;
- QEVMAT – Mobile Laboratory
- Applied Sciences – Laboratory for Structure of matter;
- Applied Sciences – Optical structure;
- Material Science and Engineering;; Establishing the properties of metallic materials;
- Material Science and Engineering – Laboratory – Material Science;
- Computing equipment; software; software for mechanics.

B.3.1.3 Valorization of research

The results regarding scientific research have been analyzed by taking into account: the financial resources involved; the value demonstrated by publications; the number of Ph.D. theses submitted; the use within the socio-economic environment of the results obtained.

a) Examining the financial resources involved, we have monitored the dynamics of total values (quite significant in 2006 as compared with 2005 and especially 2004),, but also the structure of expenditures, focusing on expenses for investments.
b) With regard to the value demonstrated by publications, we checked the papers published in ISI journals or in indexed data bases, books in print at international publishing houses, the important treaties or monographs, communications given at significant international conferences in every field.
c) Examining the Ph.D. theses submitted, it was difficult to draw a clear-cut conclusion, about whether the results obtained would produce effects for the development of new research areas, at least in a predictable future, in the domain of Ph.D. supervisor.
d) With regard to the use within the socio-economic environment of the results obtained, it seems that that according to the last reports, the impact has increased (see in the Annex the report for 2006).

Numerous conferences, symposia, workshops etc were organized in UPB (see ANNEX). University POLITEHNICA of Bucharest consequently participated to National research Fair. UPB has presented its involvement in scientific research, in the frame of FP6, in 2007 in Brussels; the concrete steps taken for making the scientific park, meant to facilitate technologic transfer, were also presented at this event.

Young researchers, under 35, authors of ISI papers have received prizes; the annual awards *"Jn Tempore Oportuno" and "Opera Omnia"* have stimulated research workers and increased the visibility of the university.

B. 4 - Financial activity of university

B.4.1 Budget and accounting

The **management regarding all financial and accounting actions** has been concentrated in an integrated management (IMAFU) for the financial administration of UPB. In this respect, its application covers the interface with the students (secretarial work), hostels-canteens (administrative and accounting departments), the central financial department (synthesis reports). We do intend to extend the services, for external users (students, Ministry of Education) who will be able to have access to the system under maximum security, obviously, at their level of interest.

Further, we present several examples of use: Legislation, Regulations within HEI-s; Analysis of information regarding financial accounting for students; Module for patrimonial direction in hostels and canteens; synthesis financial reports.

The information product will further provide the following functions: Module for the financial management of student activity; module for writing up and valorization of annual reports.

Starting from these new functions, we have developed the integrated product named EMSYS (Enterprise Management SYStem); this package is in line with the requirements agreed by international regulations.

B.4.1.1 Distribution of expenses

University POLITEHNICA of Bucharest has a yearly budget of earnings and expenses elaborated by its Economic-Financial Department and approved by the Senate. For 2006 and 2007, the budget is presented in ANNEX.

The expenses allocated for the salaries payment are rationally dimensioned; for example, in 2006, they were of 98,2 million lei, that is 70% of the entire resources for the educational activity.

At the level of the general budget, the salary expenses (research included) were of about 119 million lei, of the total earnings of 415 million lei, coming back at the level of 28%.

It is thus assured a sustainable development.

The report regarding the fulfillment of the budget is presented in the ANNEX for 2006.

The fees, which are calculated in accordance to the medium schooling costs, in 2006/2007, represented 3200 RON for the university degree, and 4800 RON for the master.

The fees are approved by the Senate and made public. University POLITEHNICA of Bucharest gives financial assistance (i.e. payment echelon, fees reduction) for special situations.

The method of using the fees is made public with the analysis of the budget execution.

University POLITEHNICA of Bucharest has proving papers of the fact that it is the owner of 100% of the buildings and all of the necessary endowments.

B.4.1.2 Bookkeeping

The bookkeeping activity is organized according to the legislation for public institutions.

The bookkeeping activity is informatized (Sicob program) and permanently transparent.

The salaries and the scholarships are paid on cash cards.

At this moment, the bookkeeping activity is improved by the modulus of rent contracts administration and, respectively, of personnel administration. It is in the implementation process the information administration of the fees cash.

B.4.1.3 Audit and public trustworthiness

The financial activity is internally audited.

The bookkeeping balance and the execution account are made public after their examination by the Senate.

C. QUALITY MANAGEMENT

C.1- Strategies and procedures for quality assurance

C.1.1 Structures and policies for quality assurance

C.1.1.1 Organizing the system for quality assurance

Implementing and developing of a system for quality management (SQM) in University POLITEHNICA of Bucharest has been a main concern for the UPB management, especially starting with 2002, when based on the Senate resolution (31.01.2002), on Rector's decision, on the decision regarding nomination of members of Senate's Quality Council, a new Set of Regulations regarding the Quality Management System in UPB has been approved (see Annex).

The Quality Council, and later on, the Commission for Quality Assessment and Assurance, develops collaboration and informative actions about "good-practice" examples in Romanian universities (University TRANSILVANIA – Brasov, University "Lucian Blaga" – Sibiu, ASE – Bucharest) or from abroad (University of Porto, Portugal; University of Compiegne, France; University of Turin, Italy etc.).

C1.1.2 Policies and strategies for quality assurance

The following structures (see Annex) are functioning in UPB, all being active in developing a pro-quality approach:

- The quality Council, guided by the Rector, consisting in specialists in the field of quality from UPB, but also from outside, as well as students;
- The Commissions for quality, at faculty level, led by deans through quality responsibles;
- Working groups in the field of quality, in every chair, led by a responsible with quality at this level;
- A group of internal auditors;
- The Commission for quality assessment and assurance;
- The Department for quality, included in UPB flow chart;

There are preoccupations in UPB for implying students and administrative (or research) staff within the quality commissions.

To implement SQM, several meetings ((between academic staff and beneficiaries of education programs) have been organized; as a result, the standard documents required for an efficient functioning of the system have been composed and revised, whenever necessary.

The chosen reference for SMQ documents was ISO 9001/2001. Among the documents, we have to mention Quality Handbook, System Procedures, Operational procedures (see Annex) as well as documents for internal audit.

C. 2 - Procedures for starting up, monitoring, and periodic revising of curricula and on other activities

C.2.1 Approving, monitoring, and periodic assessment of curricula

Even from its foundation, the university was preoccupied to adapt curricula to the progresses of world science and technique, to the needs of the Romanian developing economy.

60 years ago in our university there were only three faculties (namely electrical engineering, mechanical engineering, industrial chemistry).

After 1990, due to the opening of the university towards European technical higher education and university autonomy, new research fields have emerged, so new curricula (environment engineering, material science, communications, informatics, biotechnologies) have been developed. Our faculties have adapted names and curricula so that to correspond to those in EHEA.

Now, in 13 faculties, there are 68 distinct curricula at bachelor level (licenta), covering 15 different fields.

The new programs have been authorized, and subsequently accredited, according to legislation in vigor.

As a result of adopting the Law of Quality in Higher Education, we have conceived the regulations for initiating, monitoring and periodic assessment of curricula (see Annex); these regulations sets up the steps and necessary documents for introducing a new curriculum, the main responsibility being that of the Council of the promoting faculty, followed by the Senate approval.

We think that evaluation and assessment of curricula has to be carried out by ARACIS for bachelor studies, while the M.Sci. studies are to be approved by university Senate; this way a higher flexibility may be achieved, correlated with the changes in economic and social environment.

The faculty council evaluates (yearly) the results obtained in each study program, and, accordingly may decide changes in curricula or syllabuses.

Revising syllabuses for a given discipline is done by the corresponding professor, having the agreement of his/her chair and the approval from Faculty Council.

Revising curricula, implying alterations with more than 15% from the total number of credits, may be carried out as a result of an initiative of specialty chair, but only after an analysis of the new program and approved by Faculty Council.

Periodical assessment of curricula is performed by Faculty Council, at least once every four years for the first cycle (licență), and once every two years for the second cycle (M.Sci.).

UPB, through its Education Commission, yearly promotes the analysis of some groups of related disciplines, so that to harmonize at institutional level, education in certain fields. These analyses are debated within university Senate, proposing concrete steps to improve the quality of education in certain fields.

Among the last analyses of this type we mention:

- Analysis of economic preparation of students, in different study programs;
- Analysis of preparation of students in informatics;
- Analysis of preparation of students in Mathematics and Physics;
- Analysis of practical training in laboratories and industrial stages.

LLL-type programs are diversified and imply a great flexibility so that to correspond to the requirements of beneficiaries. Such programs are initiated by specialty chairs or centers, usually on request from economic agents, agencies or ministries; in turn, the programs are approved by the faculty council and endorsed by the Department of Long Life Learning and Distance Learning (DECID).

Study programs and corresponding diplomas are elaborated and issued according to Government Resolutions, that approve the list of domains and specializations for higher education

(bachelor). All bachelor programs have been registered into the Registry of Qualifications in Higher Education (ACPART Agency).

In order to disseminate the study programs in UPB in EHEA and to facilitate student mobility within the European program SOCRATES, we have issued INTERNATIONAL STUDENT GUIDE containing a large information package regarding structure, strategy and study programs within UPB; besides, we have written up ERASMUS UNIVERSITY CHARTER (see Annex).

International cooperation of our university with more than 140 prestigious universities from Europe, United States, Canada, Japan, allows, besides developing common programs, also revising the study programs in agreement with the experience of these universities. All faculties from UPB made their own analyses to find the most appropriate ways for integration in EHEA.

C.2.1.1 Regulations regarding initiating, approving, monitoring, and periodic revising of curricula

1) Initiating a new study program is a prerogative of a faculty, taking into account the proposal made by a chair or several chairs.
2) Initiating a new study program (either bachelor or master) implyes the following documents:
   a) Justyfying the opportunity including aims, target-public, marketing elements, similar programs home and abroad;
   b) Competences of graduates of the new study programs. They are to be approved by the Faculty Council and will be submitted to public debate; the list of competences will be accompanied by a synthesis of the public debate;
   c) Curriculum for the study program;
   d) The corresponding syllabuses for all disciplines;
   e) CVs for all academic staff participating in the study program;
   f) Description of laboratories implied;
   g) Research directions associated to the study programs as well as the main contracts within the faculty, accompanied with corresponding scientific papers;
   h) Didactic materials specially conceived for the new study program.
3) Documents presented in (2) are to be analyzed and approved by Faculty Council, provided the number of votes (from academic and auxiliary staff, students) will be at least 2/3 from the total number of votes.
4) After the approval from Faculty Council, the complete file for a new study program, is to be analyzed by the Senate Bureau, and if agreed submitted to UPB Senate for final endorsement;
5) The Faculty Council yearly evaluates the results obtained in each study program; it may decide revising its content;
6) Revising curricula, implying alterations with more than 15% from the total number of credits, may be carried out as a result of an initiative of specialty chair, but only after an analysis of the new program and approved by Faculty Council.
7) Revising syllabuses for a given discipline is done by the corresponding professor, having the agreement of his/her chair and the approval from Faculty Council.
8) Periodical assessment of curricula is performed by Faculty Council, at least once every four years for the first cycle (licență), and once every two years for the second cycle (M.Sci.). The following features are to be put into evidence:
   a) The professional results obtained by the students of study program;
   b) The results obtained by the academic staff and students in their scientific research (contracts, published papers, scientific communications etc);
   c) The results concerning the activity of the academic staff, as depicted by the

students;

d) The degree in which the graduates of the study program have found jobs in professions related to the specialization obtained.

9) Faculty Councils may evaluate the study programs, even outside the regulations stated in (6), whether the conditions in which the program take place, require this step;
10) UPB Senate, yearly promotes the analysis of some groups of related disciplines or certain fields (mathematics, physics, economics, informatics, pedagogical training);
11) LLL-type programs are initiated by specialty chairs or centers accredited by University Senate, usually on request from economic agents, agencies or ministries; in turn, the programs are approved by the faculty councils and endorsed by the Department of Long Life Learning and Distance Learning (DECID). For the final approval the initiator must present a detailed content of the program, the list of the academic staff, including their CVs.

C.3 - Unbiased and transparent procedures for evaluating the learning outcomes

C.3.1 Evaluation of students

C.3.1.1 Regulations on assessment and ranking of students
C.3.1.2 Integration of assessment in teaching and learning

Modernizing "didactic technology", including unbiased methods for assessment, represents one main long-term concern in UPB. Ample debates on written and/or oral examination, continuous examination throughout the whole semester, the role of grill tests etc, took place since '80, in the last century.

After introducing the system based on credits in 1997, new unbiased assessment rules to check the knowledge acquired have been conceived. Subsequently, these rules were introduced in our First Regulations of the Education System based on credits; changes and improvements have been operated in 2000 and 2002, as the system has been generalized.

The last form of Regulations for License (bachelor) University Studies and of Regulations regarding the professional activity of students were approved by UPB Senate in 2006 (see Annex).

According to the above mentioned regulations, the assessment methods are based on a set of rules regarding the mark and the minimal conditions for passing an examination. These rules are announced by the professor from the very beginning, within the first hour of lecture; the same rules are also presented on the web page of the faculty, and printed in "Student Guide".

The assessment methods use a series of principles and rules such as:

- All the activities within a discipline are to be evaluated and receive "points" out of the total 100 points for the whole discipline;
- Every point given for assessment of a certain activity must represent a percentage of received knowledge corresponding to a discipline;
- Sharing the 100 points among various activities is decided by the corresponding professor, and approved by the Executive Faculty Council;
- The points received either during the semester or at the final examination are added giving the "total number of points" (TNP);
- TNP is then transformed into "mark" (1 to 10) by dividing to 10 and rounding up:
- Passing a given discipline implies obtaining at least 50 points (out of 100), provided that the student has obtained 50%, both during the semester, as well as in the final examination;
- Nonattendance (absence) at the assessment of any activity means zero points for this activity;

- Previous fulfillment of certain activities during semester could be a prerequisite before the final examination, according to the obligations set by the professor and subsequently approved by the Executive Faculty Council;
- The final examination and mark transcription in discipline catalogue may be achieved only within examination sessions; at the final examination, besides the main professor, another member of the academic staff, having the same specialization, must attend;
- The manner of examination (written paper, oral or written and oral) is established beforehand, by the dean, based on the proposal made by the professor; the rule must be known by the students from the beginning of semester;
- The time table for partial examination, during semester, is to be established by the dean, to a given number of disciplines as approved by the Executive Faculty Council; during examination sessions, the partial examinations can take place again, either for the students who did not pass them, or for the students wishing to obtain a better mark;
- For all disciplines for which there is continuous examination during the semester, the situation of each student has to be known before a new session will start.

For Ph.D. examinations, to some "master" exams, as well as for the public presentation of diploma projects, dissertation or Ph.D. theses, external professors (from universities or other institutions with similar profile) may also participate.

The unbiased and transparent way for assessment of students is to be yearly analyzed in each faculty, starting from the Attitude Questionnaires filled in by he students.

C. 4 - Procedures for periodic quality assessment of the academic staff

C.4.1 Quality of academic staff and researchers

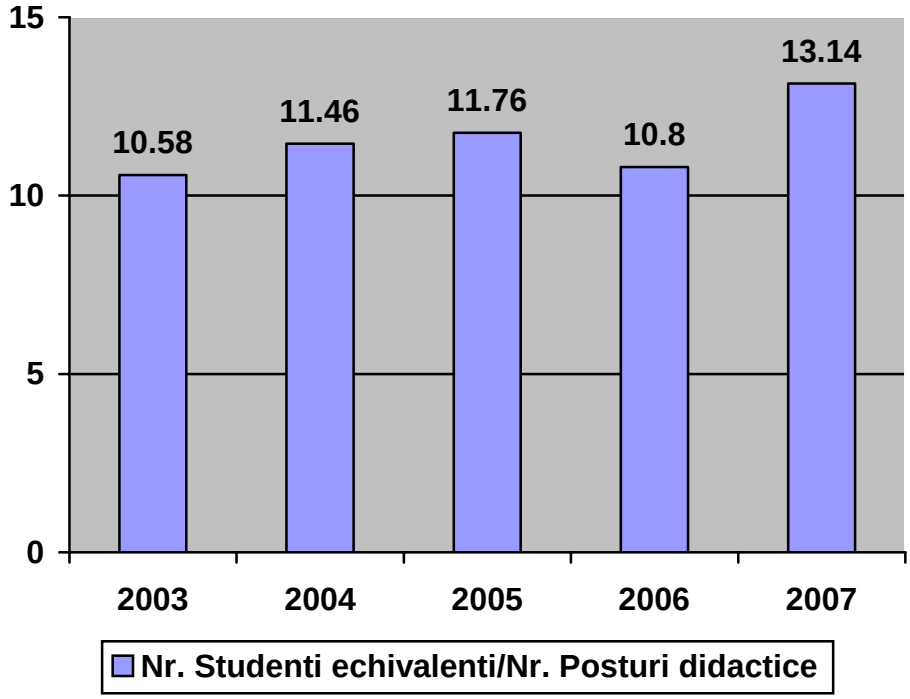
C.4.1.1 The ratio between students and academic staff

After the introduction of the current financing system in higher education, and due to under-financing (that has allowed only assuring a minimal value of wages) within the university we have started an ample endeavor to establish a coherent methodology for sharing the sums from budget financing, for different curricula and faculties.

Thus, in the period 1998-2004, several algorithms for sharing the financial resources among faculties have been proposed; repeated simulations have been carried out in 2002 and 2003. Based on these results detailed analyses were presented in Dean's Council, Senate Bureau, the Senate itself, all leading to the conclusion that such procedures are not useful in our university (they could only lead to unwanted conflicts among colleagues, without solving the financing problems).

Accordingly it has been stated that the indicators (Number of students)/(Number of didactic positions) is to be used only at university level.

The diagram bellow puts into evidence the evolution of this indicator in the last academic years.



A comparative analysis, regarding the academic year 2004/2005 is presented in the table below :

Nr.	Higher Education Institution	Total didactic positions	Nr.equiv. students	(Nr.equiv. students)/ (Nr. Didactic positions)
01	U. POLITEHNICA din Bucureşti	2740	32.059,29	11,7
02	U.Tehnică de Construcţii din Bucureşti	906	8.553,00	9,4
03	U. A.U. "Ion Mincu" Bucureşti	592	2.297,00	3,9
04	USAMV Bucureşti	732	6.931,00	9,5
05	Universitatea Bucureşti	2718	33.483,26	12,3
06	UMF Bucureşti	1980	13.205,70	6,7
07	ASE Bucureşti	1776	17.209,00	9,7
08	U. Naţională de Muzică Bucureşti	261	1.443,28	5,5
09	U. Naţională de Arte Bucureşti	242	1.370,24	5,7
10	UATC Bucureşti	280	974,48	3,5
11	ANEFS Bucureşti	126	1.263,15	10
12	SNSPA Bucureşti	203	3.018,64	14,9
13	U. " 1 Decembrie1918" Alba Iulia	328	2.733,34	8,3
14	U. «Aurel Vlaicu» Arad	371	1.991,15	5,4
15	Universitatea din Bacău	474	3.083,11	6,5
16	U.de Nord Baia Mare	473	2.747,07	5,8
17	Universitatea « Transilvania» Braşov	1712	14.677,99	8,6
18	U. Tehnică Cluj-Napoca	1028	11.605,25	11,3
19	USAMV Cluj-Napoca	381	4.173,39	11
20	U. "Babeş-Bolyai" Cluj-Napoca	2566	32.131,88	12,5
21	UMF Cluj-Napoca	933	7.573,90	8,1

22	Academia de Muzică "Gheorghe Dima" Cluj-Napoca	219	1.521,15	7
23	Academia de Artă şi Design Cluj-Napoca	114	1.099,08	9,6
24	Universitatea "Ovidius" Constanţa	1388	7.184,55	5,2
25	Universitatea Maritimă Constanţa	111	746,80	6,7
26	Universitatea din Craiova	2264	17.610,24	7,8
27	UMF Craiova	474	3.514,20	7,4
28	Universitatea "Dunărea de Jos" Galaţi	1599	11.525,29	7,2
29	UniversitateaTehnică "Gh. Asachi" Iaşi	1176	14.771,60	12,6
30	USAMV Iaşi	288	2.861,52	9,9
31	Universitate "Alexandru Ioan Cuza" Iaşi	1475	23.717,74	16,1
32	UMF Iaşi	1232	6.356,40	5,2
33	U. Arte «George Enescu» Iaşi	266	1.592,40	6
34	Universitatea din Oradea	3318	10.641,59	3,2
35	Universitatea din Petroşani	409	3.210,40	7,8
36	Universitate din Piteşti	1130	5.529,07	4,9
37	U. Petrol şi Gaze Ploiesti	817	4.931,24	6
38	U. «Eftimie Murgu»Resita	257	1.551,89	6
39	U. «Lucian Blaga» Sibiu	1408	8.768,32	6,2
40	U. «Ştefan cel Mare»Suceava	683	4.381,44	6,4
41	U. «Valachia» Târgovişte	574	4.981,92	8,7
42	U. "Constantin Brâncuşi" Târgu-Jiu	462	1.391,60	3
43	U. "Petru Maior" Târgu-Mureş	311	2.005,28	6,5
44	UMF Târgu-Mureş	505	4.906,10	9,7
45	U. Artă Teatrală Târgu-Mureş	59	252,90	4,3
46	U. POLITEHNICA din Timişoara	1154	13.653,30	11,8
47	USAMV Timişoara	565	4.457,52	7,9
48	U. de Vest Timişoara	1238	12.692,92	10,3
49	UMF Timişoara	1037	5.659,00	5,5
	TOTAL	**45152**	**384.040,58**	**8,5**

It may be said that our university, alongside with the other prestigious technical universities from Romania (University POLITEHNICA in Timisoara, Technical university in Cluj-Napoca, Technical university in Iassy) have this indicator at about 50% higher than the national average. Taking also into account the results of scientific research in these universities, a higher efficiency for technical higher education system. becomes clear enough.

Various comparisons made as a result of discussions with academics from European universities have shown that this indicator is close to that from these universities.

However, to reach certain equity with regard to expenses for each study program, we have introduced a new indicator, namely "number of hours provided for one student"; it may be obtained by dividing the total number of equivalent hours to the total number of existing students (only students taken into account in calculating the funds from the state budget). Based on an analysis of resources and expenses in 2004, we have found an optimal target of 29 hours/student.

Even if in previous years (2004-2005 and 2005-2006) there were difficulties in reaching this target, in the present academic year all faculties have fulfilled the proposed indicator.

Of course, the main concern was that this process should not affect the quality of the education process, but instead would eliminate supra-specialization and any exaggeration in counting the norms.

The fact that simultaneously with this process, the involvement of academic staff from our university in scientific research has an important increase, makes us believe that we are on the correct way.

C.4.1.2 Colleagues assessment

Within the university, for each member of the academic staff an annual collegial assessment has to b done. In this respect, we have initiated a "Fiche for collegial assessment", approved by UPB Senate (see Annex); it contains performance indicators regarding education, research or other activities useful to academic community. The last indicator of collegial assessment refers to implication within activities of the chair/faculty/university that are not usually mentioned in didactic norms; the quality to work in the team, the personal contribution in financing the chair, student guidance are also taken into account. So this criterion is very important with respect to the opinion of colleagues.

The assessment is further discussed by colleagues within the chair, and subsequently gets definitive by the Chair Bureau. When writing up assessments, the information contained in "Fiche for self-evaluation" is also take into account/

In total 25 performance indicators are used, for each a mark between 1-10 being given; finally a total is made and it is possible to use this value as an important element (altogether with other assessment criteria) in establishing the chair policy regarding promotion, "performance" wages etc.

C.4.1.3 Assessment of academic staff by students

The student opinion regarding the teaching activity of every member of the academic staff represents an important feed back, essential in improving this process. For this reason, numerous academic staff have used since long, assessment questionnaires of education activities as appreciated by the students. However, the system is not generalized yet, neither a systematic one.

During 2000-2003 there was a large debate within the university regarding the best way to achieve this objective. Several systems used in European or American universities have been compared and analyzed in the Senate Commission for Education; finally a general frame has been approved.

In 2004-2005 and 2005-2006, several faculties from UPB have experimentally tried this system, using especially printed templates. Even if for many members of the academic staff the procedure proved to be useful, the processing of several thousands sheets, keeping the confidentiality was extremely difficult. For this reason, we have decided that the assessment of academic staff by students should take place in an informatized on-line system.

For this purpose, after establishing a final content for the assessment form (see Annex) we have achieved the installation of the assessment form for every faculty, introducing all disciplines from the curriculum. We have used the application open–source MOODLE (http://modle.org) with a personalized feed-back component. We have generated anonymous accounts (as well as access passwords) for all students within university, that allow entering only once for each discipline and for a given period of time (two weeks from the beginning of the following semester).

However, the results are available only to the dean (on the basis of a card and on his own password) of the faculty. Eventually, the dean may present the results in chairs, to the evaluated persons, to the Executive Faculty Council; the Faculty Council may be informed, however, without nominalizations.

C.4.1.4 Assessment done by the university management

UPB has conceived an annual multi-criteria assessment form for every member of the academic community, since 2000. These forms are differentiated according to didactic degree (professors, readers, lecturers, assistants, demonstrators) – see Annex.

To make more objective the assessment, starting with this year, we made a self-evaluation form for scientific and teaching activities, large enough, especially for scientific activity, that allows a measurement (as a number of points) of scientific papers, research projects and of scientific prestige.

In the actual phase, the results of this assessment are confidential, so that the number of points per each member of the academic community is not public. However, every chair and faculty will make its own analysis, and in October, a report about the results at university level will be presented in Senate.

C.5 - Accessibility of adequate resources for learning

C.5.1 Learning resources and services for students

C.5.1.1 Availability of learning resources
C.5.1.2 Teaching as a main source for learning
C.5.1.3 Programs for motivation and recuperation
C.5.1.4 Services for students

Accessibility of resources develops in parallel with the informatics system of UPB that, with regard to the governmental and European Union policies on the Information Society based on knowledge, looks for:

- **Informatization of the education process;**
- **University management;**
- **Informatization of all scientific research activities**;
- **Financial-accounting management**.

In this respect, UPB has the following goals:

- Continuation of investments in the development of information infrastructure, in order to raise the level of endowments in faculties, departments, as well as in UPB's administration, promoting partnerships with important companies, so that the acquisitions are to be accomplished at minimum costs;
- Structuring of the information systems administration at faculty level (servers, local networks, calculation centers for students, etc.), in order to provide for all the members of the UPB community civilized services, centralized as possible, of high performance and connectivity Intranet/Internet. The increase of the importance of information component in the system of internal/external communication of UPB, especially by promoting web technologies;
- Providing software application portfolios, specific to each engineering field, both for the education purposes and for research, at the same level as that of great universities in the world;
- The promotion of software applications creation in specific engineering fields, that could be complementary to the applications from the market, in order to show the research effort of UPB and to create performing tools for the engineering activity;
- Promoting integrated information systems development, in which the academic and non-academic UPB community could have recognized positions of competency and excellence, as a base for national and international partnerships;
- The continuation of development of the communication infrastructure of UPB, according to the already presented project to the UPB Senate with a multilevel architecture: the increase of the communication speed for connecting to RoEduNet, the increase of backbone capacity at 10 Gbps, the assurance of a wide access for the teaching and research activities to the information resources concentrated in CoLaboratory and IBM Center of Linux Competency.

- The development of a performing information structure in all faculties and departments, with the assurance of these ones administration by the Service of Information and Communication;
- Setting up and promotion of structures/infrastructures for the development of distance learning.

Taking into account the above mentioned goals, we have developed specific activities for each component of the informatization process, as follows:

Informatization of the educational process

- Completing the infrastructure to provide good access services for Internet. For instance, we have provided primary services, as accounts for students, academic staff, auxiliary staff, e-mail and systems for information accumulation.
- Laboratories endowed with IT equipment (servers, workstations, communication infrastructure, system software, office software, equipment dedicated to data acquisition and processing, equipment specific for different fields, specialized software).
- Laboratories for individual study, with free access, to prepare home work, projects, as well as laboratories run by students.
- Electronic support for education activities, personalized for the needs of each faculty, however keeping a unitary feature for the sites of each faculty. In organizing and administrating the support for courses (gathering information about students and professors, issuing accounts for them, introducing courses from the curricula for all years of study, registering students and professors for the corresponding courses, information for users about this support) several stages have been already finished. Among the modules available within this application we have to mention: courses in electronic form, home work, forum with notifications in real time on mail, chat, questionnaires, lessons, glossaries, resources, making web pages etc.

- Faculty of Electrical Engineering http://electro.curs.ncit.pub.ro/
- Faculty of Power Engineering http://energ.curs.ncit.pub.ro/
- Faculty of Electronics http://electronica.curs.ncit.pub.ro
- Faculty Mechanics and Mechatronics http://mecanica.curs.ncit.pub.ro/
- Faculty of Engineering and Management of Technological Systems http://imst.curs.ncit.pub.ro/
- Faculty of Engineering for Biotechnical Systems http://isb.curs.ncit.pub.ro/
- Faculty of Transportation Engineering http://tet.curs.ncit.pub.ro
- Faculty a of Aerospatiale Engineering http://aero.curs.ncit.pub.ro/
- Faculty of Material Science and Engineering http://sim.curs.ncit.pub.ro
- Faculty of Applied Chemistry and Material Science http://chim.curs.ncit.pub.ro/
- Faculty of Engineering taught in Foreign Languages http://fils.curs.ncit.pub.ro/
- Faculty of Applied Sciences http://mathem.curs.ncit.pub.ro

- The management of all students contains the access to information regarding the students registered to a given course, the ability to share the students in work teams, programming the events within a course, of a site and of the user in a time table, setting a marking scale, marking, the management of files.
- Monitoring the activity of all participants enrolled to a course, as the students have the possibility to fill in a personal profile.
- The students may log in anytime and anywhere in order to interact with the support for courses.
- Both students as well as professors have at their disposal an application for technical support (http://support.ncit.pub.ro) being a constant feedback related to functional applications at faculty level, improving their facilities.

- The system for the on-line assessment of professors by the students has been implemented in some faculties from UPB.
- Access to the digital library and on-line information through accelerated development of the information system of central library from UPB, with extension possibilities for libraries in faculties and chairs. In this respect, we have purchased the system **ALEPH** 10 staff, 20 **OPAC** (http://www.library.pub.ro).
- Launching new programs by national/international partnerships to develop the information and communication system in UPB and of capacities for technological transfer.
- New projects for developing applications such as e-government, e-society for increasing the visibility of UPB in the informational society.

University management constantly targeted the optimization of management/administration structure from UPBB through the following elements:

- The web university page (http://www.upb.ro); building and maintaining the site at the level of university / faculty / chair / department / research center.
- Informatization of the admission process (http://admitere.cs.pub.ro) s; it implies (pre)registering on line, issuing the documents needed within admission process and student enrollment.
- Access to information by establishing an unique data base containing information regarding students, academic and non-academic staff, the scholar situation of students, the books in the library, research projects, curricula, spreading of students in hostels, tax payments, time tables, tasks and personnel etc (http://adeverinte.devel.ncit.pub.ro/);
- An IT system for all documents and worksheets for university management (**GEDOMANU**), based on **SivaDoc** product; in this way a set of services has been introduced for document management in the frame of University Rectorate.
- Information system for student hostels (http://cazari.pub.ro/); it controls the process of gathering and processing of the application forms in REGIE complex;
- We develop now an application for scholar management that will generate catalogues, time tables, recording final or intermediate examinations, produces statistics regarding the scholar situation of students, and also informs the students about it.
- Furthermore, we wish to introduce the accreditation ECTL for the students.

A major goal of UPB is introducing electronic resources for learning in the **Central Library**, free of charge. Due to the efforts regarding informatization, the resources of Central Library in UPB (BC-UPB) are available through ALEPH application, containing the following modules:

- Catalogues;
- Acquisitions / Serials;
- Catalogue on-line **OPAC**;
- Distribution.

For the moment the modules Catalogues, Acquisitions / Serials and Catalogue on-line **OPAC** are under current use; the module “Distribution” is still to be implemented.

In this respect, the learning resources are available through the OPAC catalogue for the entire UPB community. Now 15000 records are accessible. Even if the library has no courses in electronic form, there are endeavors to introduce the e-learning system **MOODLE** that hopefully will open access to students and academic staff to reading material for each discipline. We must underline that exposure to free access of some books, but in electronic form, must observe the legislation regarding copyright; so there are two distinct possibilities, either access to data bases on pay, or instituting stores with non-restriction documents.

In the period 2004-2006 we have provided access for a limited period of time (several months) to several data bases, by temporary agreements. For instance we must mention the access to data base **Knowell Library** and **Knowell K-Essential**, containing full text books in domains of interest for UPB. The users have accessed intensively these resources, as it results from the statistics offered by the firm that has facilitated the access; this has shown the uses potential in UPB. Accordingly, we recommend contemplating the possibility to create a continuous access to these data bases, being well known that some books have a "short life", especially in the field of ITC. The team from BC-UPB has made the necessary diligences to UPB management to obtain access to this kind of data bases.

Now there is a project „ROMDOC", (in collaboration with ETH – Zurich) to generate a server with "grey documents", namely non-restriction documents, where the copyright rule does not apply: Ph.D. theses, notes taken at courses, scientific reports etc.

Within the project Sectorial 9/2004, a virtual catalogue has been set up; it allows access to all OPAC catalogues from Romania and to IFIN-HH library; this last library has an important number of electronic books. In the same line, we have to mention an important source of free electronic documents, namely OAISTER (www.oaister.org).

An important feature is the availability of the necessary number of electronic resources – volumes and subscriptions.

So, once the access to digital resources is solved, the next problem is providing the necessary number of volumes from the same resource; as the degree of utilization is essential, this may be set by examining the access statistics over a significant period of time. Subscriptions to journals include (in 2004) the corresponding access to electronic form too, wherever the editor allows that.

BC-UPB had the initiative to consult UPB community on the need for data bases, however the result is not significant. Subscriptions for journals are made rather based on tradition of previous collections. All current subscriptions for scientific journals from home or abroad are listed on the web page of BC-UPB (http://www.library.pub.ro/abonamente.htm).

For each journal from the list, there is a link to the corresponding record in OPAC catalogue. Some of them are also accessible in electronic form, from the description page of the journal within OPAC catalogue – the field "electronic location". According to the contract for journal purchase signed between UPB and S.C ROMDIDAC S.A., there are 221 titles; out of them, only for 33 there is direct access to the electronic content.

On BC-UPB site there are links to the libraries of some universities that give free access for UPB community to Ph.D. theses, see http://www.library.pub.ro/servicii_01.htm

At the same site, the users may look up for internal documents of BC-UPB, for instance bibliographic research see - http://www.library.pub.ro/servicii_02.htm

Starting with 2005, the team of BC-UPB provided a temporary access (using the enterprise "Books Unlimited" as intermediary) to various data bases (SCIENCE DIRECT, SPRINGER LINK, OXFORD JOURNALS) having integrally electronic text. Among other collaborations, BC-UPB has provided a limited access to IMECh Proceedings and EBSCO.

CNCSIS (at the initiative of MEdC) has a subscription to the data bases (for abstracts) such as Engineering Village and SCOPUS. We look forward to obtain access to data bases with complete electronic text, for instance SCIENCE DIRECT.

Both, the server and informatics system of BC-UPB is administrated and maintained by specialists from Center of Technological Transfer for Process Industries.

C.6 - Data base continuously updated regarding internal quality assurance

C.6.1 Information systems

C.6.1.1 Data bases

UPB presents on its site, www.pub.ro, information regarding the institutional state of quality, and Quality Council and Quality Commisions from faculties are informed and analyse the quality of education process in partner universities from France, UK, Germany, Holland, Portugal etc comparing the results (http://www.pub.ro/romana/consiliulcalitatii/index.htrnl).

At UPB level, there is a centralized data base and a corresponding structure to administrate all scholarity problems; furthermore, there are preoccupations to complete this data base with information regarding the jobs obtained by our graduates on the labor market.

C.7 – Transparency in public interest information regarding curricula, certificates, diplomas and qualifications offered by the university

C.7.1 Public information

C.7.1.1 The offer of public information

University POLITEHNICA in Bucharest has a large variety of means for dissipating relevant information about university life.

Obviously, the main way is its web site (www.pub.ro), with an easy access. Information presented here is useful for students, university personnel, future candidates, for every member of the public, from home or abroad, interested in the activity taking place in university POLITEHNICA of Bucharest. In this respect, the site contains general information (the history of university – the oldest technical university in Romania, its Charta, the Senate members altogether with their addresses, the members of Senate Bureau etc), but also more specific ones (structure, diplomas awarded, Faculties, Departments, Chairs); for each faculty, besides relevant addresses, we give the name of the web page corresponding to the faculty. Also, academic staff receives useful information (Operational plan of UPB, the main resolutions issued by the Senate, regulations regarding mobilities abroad, contests for occupying academic positions etc). Every year we present detailed information with regard to admission procedure (available specializations, methodology, number of places etc); the students are kept informed about own regulations (hostels-canteens), about rights and duties. Also, relevant data about scientific research in UPB are represented.

In its relations with universities or other organizations from abroad, UPB uses a presentation brochure, printed in English, including many color photos; the content is also available on CD-s.

Each faculty has its own web page; these addresses are listed on the main university page. Faculties present their chairs, with all significant data (academic staff, including CVs, the scientific equipment available, the main scientific and technical preoccupations, including a list with scientific publications, patents, books etc). An important place is occupied with the presentation of curricula for all specializations, so that the students may know in detail the study programs. In some faculties the pages contain the time tables, as well as many courses (in electronic format) written by the academic staff from the faculty. We have also to mention that all faculties have printed brochures, leaflets, designed to be distributed in secondary schools, for the information of future candidates.

In general, information offered on UPB web page, may be compared with that of partner universities, for instance from CESAER consortium made by the main European technical universities. Besides information presented in Romanian, our site contains two sub-pages with significant data, in English and French respectively. Also, starting from CESAER page, the site www.pub.ro may be reached due to the existing link. Some short data (profile, contact persons, addresses etc) about UPB may be found in the (printed) guide of world universities.

C.8 - Structures for quality assurance; their functionality according to law

C.8.1 Institutional structure for quality assurance in education

C.8.1.1 Implementation of procedures for quality assessment and assurance

The commission for assessment and quality assurance (set up according to the law and approved by UPB Senate) must produce yearly its report; this report is made public, being posted on UPB site and it should make proposals for quality improvement.

Using common activities with other universities from home or abroad, (Ph.D. theses with two supervisors, mobilities within Socrates program, research contracts) UPB identifies and adopt „good practice examples" in education, administration and research.

Partnerships between UPB and various employers of our graduates (industrial enterprises, banking institutions, local administration etc) or with secondary schools (providing future candidates) generate information; these facts are taken into account for planning and organizing the education and research processes.

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