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**Investește în oameni!**

Proiect cofinanțat din Fondul Social European prin Programul Operațional Sectorial Dezvoltarea Resurselor Umane 2007 – 2013  
Axa prioritară 1 „Educația și formarea profesională în sprijinul creșterii economice și dezvoltării societății bazate pe cunoaștere”

Domeniul major de intervenție 1.2 „Calitate în învățământul superior”

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Contract POSDRU/155/1.2/S/141894

**POLITEHNICA University of Bucharest**

**The Romanian Agency for Quality**

**Assurance in Higher Education**

Registration number...../.....

Registration number...../.....

# **INSTITUTIONAL SELFEVALUATION REPORT**

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2015

1

**PARTENER**



CENTRAL AND EASTERN EUROPEAN  
NETWORK OF QUALITY ASSURANCE AGENCIES  
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## FOREWORD

The University POLITEHNICA of Bucharest is the most prestigious school of engineers in Romania, with a seniority of 197 years, which, while being always young due to the young age of the people stepping in, has been constantly calling for and expecting the young ones. As Gheorghe Lazar used to say in the *Notice* periodical: “*Do come you all, from all over the country and regardless of your status!*”, and by these words, by means of a *Princely Order*, in 1818 one opened the first Higher Technical School where teaching was



done in Romanian and the first engineer – specific courses took place, within Saint Sava Monastery in Bucharest, which, in 1832, shall be reorganized within the Saint Sava College. On October the 1<sup>st</sup> 1864 one has established the “School for Bridges and Highways, Mines and Architecture” which, on the 30<sup>th</sup> of October 1867, shall

become the “School for Bridges, Highways and Mines”, with the length of studies of 5 years. On April the 1<sup>st</sup> 1881, under the leadership of Gheorghe Duca, the institution shall undergo a certain restructuring and shall become the “National School for Bridges and Highways”. On June the 10<sup>th</sup> 1920 one has established the POLYTECHNICA School in Bucharest, having four sections: Electro-mechanics, Constructions, Mines and Metallurgy, Industrial Section. As of November 1920, the name shall change into POLYTECHNICA in Bucharest.

On the 3<sup>rd</sup> of August 1948 one has established the POLYTECHNICA Institute in Bucharest, which would initially include a number of four faculties and where, as of 1950, there has shown up the vast majority of today’s faculties. ([Appendix A1](#)).





Based upon the resolution of the academic Senate in November 1992, the POLYTECHNICA Institute in Bucharest has become by virtue of the Minister's Order no. 7195/19.12.1992 ([Appendix A2](#)) the **University POLITEHNICA of Bucharest (UPB)**.

Nowadays UPB has a number of 15 faculties ([Appendix A3](#)) and provides its more than 27 000 students with a highly performing education, as supported by a complex research activity, according to the exigencies and with the means provided by the modern information society.

The University POLITEHNICA of Bucharest assumes the concept of an **innovating university**, both in terms of shaping up the human capital, by which one conditions a country's innovation capacity, in terms of the scientific research which is **knowledge creating**, as well as in terms of the **technological innovations and adjustments** which condition the country's economic growth.

The concepts of **one innovating** university is suggestive and all - encompassing. Here one also finds included the notion of one **entrepreneurial university**, there being included the enterprise connotation, within the meaning of one deliberate effort of institutional construction, which requires some specific **objectives and activities**, as well as a considerable consumption of **both intelligence and energy**.

University teachers are the only ones able to represent the security of the fact that **academic values shall be the ones to govern change, which may increase tremendously the institution capacity in terms of the latter's reputation, resources and development**.

**An innovating university**, just like the high tech companies, shall encourage and develop a certain **labor culture**, by which the **departments and faculties** shall become, in their turn, such **innovating units**, which shall open themselves to the exterior as well as to new relations, by identifying some complementary financing resources.

At the same time, the **cultural dimension** shall maintain its major importance in terms of cultivating the institutional identity and a distinctive reputation.



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## A. INSTITUTIONAL CAPACITY

### A.1 – Institutional, administrative and managerial structures

UPB provides for the accomplishment of one highly performing education, as supported by means of a complex research activity, according to the exigencies and the means provided by the modern informational society. At present, UPB has over 27 000 students, included within one of the three studying cycles. The first cycle, the **Bachelor Degree** cycle, has the length of 4 years and 240 credits. The second such cycle, namely the **Master Degree** cycle, has the length of 2 years, enables the carrying on with the studies and the specialization for the first cycle graduates. The scientific commitment is confirmed by the graduation of the third cycle, namely that of a PhD Degree, with the length of 3 years. The training is structured as per optional studies fields / specializations / directions. Also, within UPB one organizes post – academic studies of continuous training, or of professional conversion.

The didactic activity is provided by a staff which currently consists in the ongoing years, of a number of 1382 teachers holding an unlimited length agreement, of which 331 teachers, 284 readers, 513 head of works / lecturers and 254 assistants. To the aforementioned, a number of other 575 associated teachers shall add, namely: PhD students, specialists within the industry or research, retired teachers within UPB.

The academic community of the University POLITEHNICA of Bucharest has always had autonomy as its main goal and has been striving to evolve in a way that is at the same time comparable to that of the great universities from around the world a distinctive mark of its own personality.

Paying its due respect to the values of academic freedoms and ethical integrity and remaining true to its 197-year long tradition, the institutional administrative and managerial structure of the University is fully functional and pursues strategic objectives that are clearly defined and specially conceived to enhance professional performance.

In view of increasing the quality of the educational process, some well known and appreciated personalities of the scientific life at a national and international level are invited in order to hold a number of lectures or courses, particularly at some MA programs organized by the faculties within UPB.

The University POLITEHNICA of Bucharest stands for an integrant part of the international academic community, sharing the creed within the same moral, educational, scientific and cultural values. It is a member of some important European academic organizations:



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- **The Conference of European Schools for Advanced Engineering Education and Research (CESAER)**, which includes top scored universities in Europe, with an advanced research in the engineering field, UPB being the single higher education institution in Romania existing within this association. UPB takes part in the following work groups: IDT - Innovative Doctoral Training; TFE - Task Force Entrepreneurship; GES - Gender Equality Survey; RI – Research Infrastructure ;HR – Human Resources in Academia(<http://www.cesaer.org/en/members/romania/>).

- **European University Association (EUA)**, as a member with full rights, and as of 2012 also a member of EUA-CDE (European University Association-Council for Doctoral Education), ([www.eua.be](http://www.eua.be)). Within this particular association, UPB has been included within the project called FRINDOC belonging to EUA (Framework for internationalization of doctoral education) as well as on the list of participants for the debate of the future of doctoral studies within the EU, under the generic title of “The Things of Shape to Come”( AUF) as a titular member.

- **Agence Universitaire de la Francophonie (AUF)**

As of 2013, UPB is a partner within the international university consortium which organizes by help of AUF-Central and Eastern Europe Office, the MA studying program called “Didactique du Français et des Langues”.

- **Black Sea University Network (BSUN)**

As of 2012 the university has taken part within **Eugen Ionesco program**, which is financed by the Romanian Ministry of Foreign Affairs and managed by AUF, by which within UPB one has organized a number of doctoral and post – doctoral studies.

Given the globalization phenomenon, UPB is very much interested in enhancing the contribution to the international exchange of values, paying special attention to the bilateral cooperation agreements. Increasing the degree of mobility for both studies and teachers stands for one priority direction within the internationalization process of UPB. For this wish to come true, a special contribution is brought by the Lifelong Learning Program Erasmus, the main actions conducted by virtue of this latter program being:

- Students mobility for studies and practice placements;
- Teachers mobility for teaching in various higher education institutions



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## A.1.1 Mission, objectives and academic integrity

### A.1.1.1 Mission and objectives

The University's mission encompasses education and training, knowledge-generating research, creativity and innovation. Education, training, research-based knowledge and technological development and innovation can only exist and flourish in an environment that based on academic fairness and integrity.

The University POLITEHNICA of Bucharest undertakes the **status of an advanced research and education University**.

**Ref 1 . The mission undertaken by the University POLITEHNICA of Bucharest is thought to be a crossroad of education, by professional training, the scientific research, by producing knowledge and innovation, as the society's main objectives and by the knowledge – based economy, by promoting some new fields with a given role in providing for the quality of life, in compliance with the provisions registered within the Europe 2020 Strategy.**

As an acknowledgment for the accomplishments of the entire academic community, in terms of the excellence of the studying programs, the quality and visibility of scientific research, by its administrative and institutional capacity, the University POLITEHNICA of Bucharest has classified in the category of **advanced research and education universities**, being the sole Romanian university which has its place within the first category (A) in all hierarchical fields.

**The producing of knowledge, mainly by means of scientific research, the transmission by education and professional training, the dissemination by information technologies, the use of technological innovation, the cultural dimension stand for those elements that come to define the uniqueness of this university.**

The most important factor in the development of academic excellence is to attract a critical mass of students and teachers with outstanding professional performance

In this respect, UPB makes constant efforts to attract its own graduates and graduates from other universities to enroll in Master, PhD or postdoctoral studies, as well as teachers and researchers from prestigious universities in EU and non EU countries, which are important drivers for the success of the University's ranking among the top universities worldwide.

Academic autonomy, relevant governing bodies and a powerful management with good leadership skills are the key goals pursued by the University POLITEHNICA of Bucharest under its University Charter (Annex A4) UPB published on the UPB website <http://www.upb.com/about-upb.html>



The Charter is a document that outlines the University's individualization in the Romanian Area as a part of the European Higher Education Area.

The institution was founded in 1818 by a Royal Edict and its name appears later on in documents signed by successive rulers such as Barbu Știrbei, Alexandru Ioan Cuza and the Kings Carol I, Ferdinand and Carol II, In 1948, the school is reorganized under several successive government decisions.

By its strategy, institutional structures and strategic objectives, and owing to its inter- and transdisciplinary bachelor, master and doctoral programs and to its significant research work and its partnerships with universities from Romania and from European Union and non European Union countries, the University POLITEHNICA of Bucharest is a landmark in the European Higher Education Area.

Ref 2: To be successful, the management structures of the University act strategically in terms of the direction they are heading to in their endeavor to become more and more **effective** and achieve **measurable results**, identifying continuously new ways to improve the **capacity of their leaders** to steer the University towards the highest levels of performance in the pursuit of its mission.

The management structures within UPB promote a **philosophy of success and excellence**, a culture of constant reflection on the **present and the future directions**, of change and **learning**.

By the Europe 2020 Strategy, the European Union has set the following objectives for the member states:

- One shall improve the quality of the national education systems;
- One shall enhance performance in research;
- One shall promote innovation and the transfer of knowledge within the Union;
- One shall make full use of information technologies and communications;
- One shall provide for the transposition of innovating ideas into new products and services that generate growth, good quality jobs and which contribute to the approaching of challenges faced by the European and global society.

In line with the Europe 2020 Strategy, the University POLITEHNICA of Bucharest has set itself to achieve the following overall and specific objectives, in view of maintaining and enhancing its position as a highly performing university at both a national and an international level:



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### General objectives:

- Promoting academic freedom, honesty and integrity, equal opportunities in terms of access to academic study programs, independent thinking, innovative spirit and openness towards international scientific community;
- The establishment of an assessment and quality assurance system in all fields of academic life, in view of achieving academic excellence in teaching / learning and scientific research and the development of a quality related culture, by relating to both national and international reference standards and indicators;
- Promoting flexible academic programs which shall enable the assertion of students' personality, the development of the latter's intellectual abilities and professional knowledge, according to their talent and aspirations, as well as the shaping of professional and cross – cut competences that are appropriate for the their future jobs;
- Capitalization of the formative role of scientific research, in academic education, as a factor promoting a favorable climate for the creative and innovative spirit, and also the increase of scientific production, as a key element of a country's economic development;
- The development of a highly performing management system, of a management that takes part in all activities, as conducted;
- Identifying and attracting as many extra – budgetary income sources, as possible;
- Enhancement of university role within the economic and social environment.

### Specific objectives:

#### ➤ Education process

- Promoting quality in the didactic activity, by a number of studying programs which shall meet the requirements of the labor market, the students' needs in terms of the development of their professional and cross – cut competences, that are constantly renewed in terms of scientific contents and the teaching and assessment methods;
- Increasing the offer of studying programs, at all levels, including the post – academic one, which shall also focus on the inter and trans – disciplinary approaches or the collaboration with certified universities in Romania and from the EU;
- Orientation towards students in all educational and scientific activities, improving teaching and assessment methods through the use of technology and enhancement of the student – teacher dialogue;



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- Extending the interest shown to cross – cut competences, by including in the education plans of the subjects that enable the development of entrepreneurial spirit, of the communication skills, teamwork or management skills;
- The development of critical thinking, of the students' innovating spirit, by the method of approaching the teaching and assessment activities and by a relevant and flexible contents of the studying subjects.

#### ➤ **Scientific research activity**

- The identification and development of new, top fields, in terms of scientific research, including the inter and trans – disciplinary ones, where there are the necessary human and material resources, as required for reaching a critical mass, which stands for a premise in achieving excellence;
- The development of the applied character of the scientific research activity and the accomplishment of the technological transfer for the results, as obtained, by a closer collaboration with relevant enterprises in terms of their field of activity;
- The development and enhancement of the scientific research institutions and centers, including in partnership with other research institutions, universities or economic agents, as an essential factor in the process of increasing scientific production;
- Successfully taking part in competitions for financing scientific projects, out of national or structural funds, in partnership with specific universities in the country and from abroad;
- Taking part in some major research projects that are ongoing at the national level (ELI-NP) or within some prestigious bodies in the field;
- Enhancing the Scientific Board of UPB and the scientific magazines where the university is a collaborator, by its own teachers;
- Attracting young teachers and students, from the very early period of their BA studies, into several research activities, as a significant formative component within the academic and professional course;
- Supporting and developing a session of students' scientific communications, of the conferences organized within the university, as well as the promotion of the participation of teachers and students to national and international scientific conferences, in view of increasing visibility of academic research results.



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### ➤ **Human resources and students**

- The recruitment of teachers among the graduates holding the best professional results;
- Promoting an adequate climate, in view of having a harmonious professional development, by supplying all necessary means, as required for the running of the didactical and scientific research activity, as well as the access to relevant perfection courses;
- The improvement of the system for the evaluation of professional performances, both from the perspective of progress in career, and from the perspective of having differentiated wages;
- The attracting of several teachers from the country and from abroad, who enjoy a well known international prestige, in order to take part in various didactical and research activities within UPB;
- Attraction of best high school graduates, by information activities in terms of the offer of studying programs, as well as on the importance of the engineer profession within the knowledge – based society, as well as on the opportunities of getting oneself employed on the labor market, and also on the living and studying conditions within the university;
- Paying more attention to the social dimension of the University, so as to provide access of young people to teaching and research activities.

### ➤ **Internationalization and the promotion of the university image, enhancing the role in society**

- Organizing the Open Doors Days - POLIFEST, the events of career guidance and the taking part in a number of activities within the program called “A different week in School” and “Knowing More, Being Better”, and so on and so forth;
- The taking part in specialized educational fairs, both in the country and abroad, in order to let the people know about the university offer of studies;
- Constant updating of the university website, as well as the accomplishment of a number of informative brochures or promotional materials, that are adequate for the different kinds of target groups;
- Consolidating the taking part as a member within European and international associative structures;
- Enhancing the international visibility of the university by stimulating scientific production, which is relevant for the fields under management within the university, as



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well as by taking part in partnership to a number of international scientific competitions;

- Encouraging mobility of both teachers and students, by taking part in a number of programs and projects with a national and international financing;
- Increasing the number of students from the EU and non – EU countries, by creating attractive living and studying conditions;
- Enhancing didactical and scientific research activities with an international participation and the increase of the number of PhD papers that are coordinated under a co – tutelage system;
- Enhancement of studying programs in foreign languages;
- Constant collaboration with the economic and social environment, the involvement in the accomplishment of policies and strategies at both a regional and a national level, by the university specialists’;
- The consolidation and development of the University Museum.

#### ➤ **Management and quality assurance**

- The elaboration and implementation of several policies, strategies and procedures which shall provide for a quality and competitive administrative and academic management, with an efficient capitalization of resources and the providing for the conditions for a sustainable development of the university and the latter’s assertion within the national academic background, as well as at an international level;
- Setting up a highly performing managerial team, at all levels, with a strategic vision and some adequate implementation plans;
- The supply of an environment that is in favor of didactical and scientific activities, for both students and teachers, by means of some well equipped education and research spaces, as well as a number of accommodation facilities and for the social – cultural activities for the university students;
- Attracting additional financial resources, out of various sources, which shall enable a stable financial balance;
- The constant development of quality assurance activities, by relating both to national and the international standards, the development of a quality related culture among teachers, students and also at the level of the administrative personnel, by integrating the quality assurance practices within current activities;
- Constant monitoring of the university position within the top classifications at the international level, as well as the identification of those means aiming at capitalizing



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the strong points of the university, in view of reaching a reasonably better position in these classifications.

#### A.1.1.2 Academic integrity. Enhancing the academic community spirit

The academic integrity, the enhancement of the academic community spirit shall be accomplished by promoting several principles, namely:

- Cultivating the principle of transparency within the relation with internal and external partners;
- Promoting a performance and probity – based organizational culture;
- Stimulating several consultative and flexible working techniques and methods;
- The existence of several internal integrity assurance mechanisms and for the elimination of the conflict of interests;
- The development of the relations of partnership with public and private organizations, for the support of the process of fast and dynamic integration of graduates within the economical – social life, by identifying and occupying a certain job position in compliance with the studies they have graduated;
- Discouraging and eliminating any forms of corruption whatsoever;
- Investigating the tendencies of change on a social – economic level and the elastic, fast adjustment to the new requirements.

Academic integrity is also provided by the independent operation of the **Commission of Ethics and Academic Integrity**, the existence of the **Code of Ethics and Academic Integrity**, the Commission of Ethics and Academic Integrity ([Appendix A5](#)) operates based upon its own regulation ([Appendix A6](#)), as approved by the University Senate and posted on the University website at the following address <http://www.upb.ro/despre-upb.html>.

**Ref.1** The University, by the University Senate, controls the way how one complies with the Code of Ethics and brings proof to the latter's enforcement by the resolutions it passes. The Commission of Ethics and Academic Integrity aims at complying with the code, receives notifications for settlement purposes, debates all cases under discussion, proposes a number of solutions and makes an annual presentation within the University Senate ([Appendix A7](#)) of a report regarding the cases and the settlement related solutions, which is posted on the UPB website. The solutions, as proposed, are applied.

**Ref.2.** In view of fighting against intellectual fraud, UPB used anti – forgery software for the checking of scientific works.



### A.1.1.3 Public liability and responsibility

The University POLITEHNICA of Bucharest has undertaken public liability and responsibility for:

- The studying programs, as offered;
- The university sustainable development;
- Opening the university towards the social and economic environment;
- Integrating the university at a European level, by supporting the programs of academic cooperation and research;
- Ensuring the communication with the state institutions, the partners from the economic and social environment, with the universities from the country and from abroad;
- A balanced promotion of the interests of faculties, departments and research and constant training centers within UPB;
- Enforcing and complying with the legislation in force;
- Collaborating within the university, collaboration between faculties, departments, research centers, etc.;
- Supporting the initiated programs, as well as the ongoing ones, as approved by virtue of the Senate's vote;
- Initiating new projects, of academic development,, of research, as well as of improving the material basis as well as of the patrimony;
- Providing for an academic climate of collegial collaboration.

**Ref. 1.** Internal audit is accomplished at the institution level and as per compartments based upon the university own regulations and procedures and focuses on the financial – accounting fields, the research and administrative field, the teaching – education – evaluation process, the academic integrity field. The departments involved are: the internal public audit department – with responsibility in terms of the financial – accounting processes and the quality management service which accomplishes audits in terms of the educational and administrative processes. The scientific research activity audit at an individual level and at the level of research centers is provided by DMACS under the coordination of the pro – rector appointed with the scientific research. The audit reports are presented and debated within the Senate on a yearly basis, and one shall draw up an improvement plan.

**Ref 2.** The university has development a series of structures and instruments that are specific to managerial control, according to the Minister of Public Finance Order no. 946/2005 for the approval of the Internal / Managerial Control code, with the latter's subsequent amendments. The commission for the monitoring, coordination and



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methodological guidance of the development of a managerial control system (Appendix A8) coordinates and controls the implementation within the university and at all the latter's structural entities, of the standards of internal controls, in compliance with the law. Within the structure of the General Administrative – Economic Directorate, in view of implementing several control procedures and mechanisms, one has incorporated and established the Legislation and Internal Control Office, which, alongside the other structures within the university, is drawing up and implementing the standards stipulated within 946/2005. Within the university, one has implemented all standards that are stipulated by the legislation in force (Appendix A9, A10). The method of organization of the guidance and control process enables the updating of standards according to legislative amendments, as well as the capitalization of good practices and of the experience having been acquired in this particular field.

Within the organizational chart of UPB there is a special department which conducts its activity based upon the financial audit procedures, as drawn up in compliance with the provisions of the Law no. 672/2002 on internal public audit and the Internal Audit Annual Plan.

The audit of the university activity is carried out by the internal audit department, in compliance with the audit annual plan, as approved by the Board of Directors and with the Audit Plan of the Ministry of Education and Scientific Research. At the same time, for the research projects and the projects financed out of external funds, there is the possibility of one's contracting such audit from specialized audit companies (Appendix A11).

## A.1.2 Management and Administration

### A.1.2.1 Management system

The management system of the University POLITEHNICA of Bucharest is operating in compliance with the legislation in force, according to the University Charter, the Regulations and Methodologies having been approved by the Senate.

The UPB Senate stands for the supreme authority and conducts the latter's activity for the length of a 4 year mandate, based upon its own regulation (Appendix A12), as posted on the university website which may be found at the following address <http://www.upb.ro/despre-upb.html>.

The management structures within UPB are:

- The university senate and the board of directors, at the university level;
- The faculty council;
- The department council.



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Within UPB there also operates the Doctoral School Council, at the level of the Doctoral Schools within the faculties and the Council of Academic PhD Studies, at the university level.

The election of the management structures shall be carried out by complying with the Law no. 1/2011, with the subsequent legislation regarding the election of the management structures within universities, with the University Charter and the Election Regulations, as presented within (Appendix A13), all aforementioned public documents being posted on the website at the following address <http://www.upb.ro/despre-upb.html>.

The election mechanisms comply with the principles of academic democracy and the norms of representation stipulated within the law and within the University Charter.

For the election of the deans, and, respectively, of the rector, there is the obligation on the part of the candidates to publicly present a managerial plan with the presentation of the strategic objectives which the said candidate undertakes, according to the methodology approved by the Senate (Appendix A14).

Students are also represented in all management structures, in accordance with the percentage stipulated by the law.

The university charter and the election regulation (Appendix A15) establish the procedures for the election of students by the students, without any interference on the part of teachers or of the management of faculties or of the university.

The managing style under practice (as undertaken by virtue of the Managerial Plan) is based upon the consistent promotion of the following principles:

- a) academic freedom and autonomy;
- b) "open doors";
- c) providing for a participative management framework;
- d) availability in terms of solving problems;
- e) trust in people;
- f) undertaking liability for managerial actions.

**Ref.1.** Within UPB there operates an efficient system of communication of those strategic and operative decisions, the information being disseminated by modern means such as the Internet, Intranet, on the university website, by newsletters, as well as by classical means, such as by display, telephone communication, or by organizing several periodical meetings.

It is worth mentioning that the University POLITEHNICA of Bucharest has avoided creating power poles and, as such, its has always taken decisions in joint meetings of its managing bodies (i.e. the Executive Panel of the Senate and the Board of Directors). Moreover, the Senate's meetings are always held with the participation of the Board members so that decisions are consistent and reflect the debates in the Senate.



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Also, the University POLITEHNICA of Bucharest is promoting a constant dialogue with the students, based upon a good partnership, by:

- Students' taking part in the decisions passed within the university at all levels;
- The existence of the Students' Code, which stipulates any student's rights and obligations;
- Students' taking part in the evaluation of teachers;
- Collaboration with and supporting the clubs and micro – clubs organized by students;
- The Psycho – Pedagogical Advisory and Career Guidance Center;
- Supporting the activity of students' organization, for the development of useful projects for the university students;
- The provision within the Students' Dwelling complexes from Regie and Leu, for some civilized living conditions and a climate that is adjusted to students' requirements.

#### **A.1.2.2. Strategic management**

Within the managerial activity, the management team of the University POLITEHNICA of Bucharest, promotes the following:

- *realism and dynamism of actions*, by placing the same within the legal and institutional context;
- *creativity and flexibility* within the management process, by promoting and supporting innovating solutions, which may increase the quality and efficiency of specific activities from various distinct faculties, departments and compartments of the University;
- *coherence of measures*, so that all actions shall be subject to the fundamental objective of the academic community, as defined within the university;
- *preoccupations being centered on the quality of those activities* relating to educational training, scientific and publicist research, the services provided to students and also to the other beneficiaries;
- the internal and external assessment of the quality of university training and scientific research;
- *the managerial process efficiency*, by the involvement of all factors and decisional sectors, of the teachers, students and auxiliary personnel, within the analysis and running of the various activities according to the competences assigned by virtue of the Regulation for the Organization and Operation of the University POLITEHNICA of Bucharest ([Appendix A16](#));



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- *transparency* in setting up strategic objectives, as well as in terms of adopting and applying the operative management measures, by opportunity studies and the information of those concerned on the solutions having been identified;
- *openness* in the dialogue with all groups of interests, which gravitate around the University, which shall be materialized in the availability in terms of discussing, negotiating and cooperating with partners from the university and extra – university environment, in the country and from abroad.

**Ref.1** University development has been based upon the Strategy for UPB development during the period 2008 - 2012 ([Appendix A17](#)) and the Rector's managerial plan for the period 2012-2016 ([Appendix A18](#)), which has been voted by the entire academic community, upon the election of the rector (Strategic Plan). The documents are posted on the university website at the following address <http://www.upb.ro/despre-upb.html> .

The provisions of the latter Managerial Plan have been updated by the operational plans having been drawn up given the evolution and the national and international context ([Appendix A19](#)), as presented and approved by the University Senate, as posted on the university website <http://www.upb.ro>. Each year, during the last senate meeting, one shall present a report regarding the stage of accomplishment of the university activity for the said year and one shall draw up the rector's activity report, which shall be publicly presented within the Senate, in March the following year ([Appendix A20](#)) as posted on the university website at the following address <http://www.upb.ro>.

**Ref.2** The University POLITEHNICA of Bucharest shall hereby undertake, in view of maintaining and enhancing its position as a highly performing university at a national and international level, the concept of one innovating university, both in terms of the training of human capital, in terms of knowledge producing scientific research, and by means of the innovations and technological adjustments, within the context of a sustainable development. For the implementation of the university strategy, one has filed a set of strategic decisions and action plans, aiming at an integrated development of education with scientific research, with a focus on excellence, having as the central axis the promotion of sustainable development values within the said university. The strategy for the period 2012-2016 has as its central axis the development of human resource and of the university infrastructure, alongside the promotion of the university image.

Within the managerial process, the University POLITEHNICA of Bucharest aims at increasing the involvement on the part of the decisional sectors – the deans, department managers, scientific research centers, directorates, students, etc.



The University POLITEHNICA of Bucharest promotes the **enhancement of the decisional autonomy of faculties, departments, research institutions, research centers**, in view of streamlining the entire activity within the university.

**The decisional autonomy both at the university level and at the level of the subsequent structures has been simultaneously undertaken with the undertaking of public liability for the initial actions.**

Transparency within the operative management has been ensured by the presence of both the union leaders and of the students' representative at the Board of Directors meetings, as well as by the communication to and through the Senate to the academic community, of the decisions having been taken. For information purposes, one makes use of the facilities of the Internet and Intranet networks.

The University POLITEHNICA of Bucharest has made a ruling on the participation of the academic community members at the running of administrative processes.

**Ref.3.** The strategy undertaken by the UPB management with the year 2020 as a horizon, has as its main objective the increase of efficiency in terms of the use of resources and the minimization of operating costs, by:

- mounting intelligent building monitoring systems (BMS);
- providing for the demand for water, out of its own sources;
- the use of renewable energy sources;
- monitoring the utilities networks (electric, thermal, water):

### **A.1.2.3 Efficient administration**

UPB has an efficient administrative structure, which meets the university operating and development needs, as drawn up in compliance with the legal provisions and approved by the Senate. Any time a legislative amendment and / or the activity development have/has occurred, as the latter have required the establishment of a given structure, one has taken measures, as required, in order to establish such a structure and to employ the specialized personnel. The administration organization and the qualification of the staff allow for an appropriate operation by the services provided to the university community.

**Ref.1:** The University has established the Internal Managerial Control office which, alongside the other internal structures, has elaborated a number of operational procedures in compliance with the legislation in force, in view of providing for the framework for the constant development of administration performances.

**Ref.2:** The level of informatization of UPB administration is compatible with the one from the European Area.



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The strategy relating to the development of the information and communication system of the University POLITEHNICA of Bucharest has been based upon the University strategy, as the latter was envisaged in the Rector's Managerial Plan and the annual Operational Plans. Of course the basis for a strategic development is represented by the governmental policies and those of the European Union, so as to ensure within UPB the expansion of the Knowledge – Based Informational Society and the increase of the quality of the information services provided to the community.

At the same time, the university policy has aimed at increasing the informatization degree by

- the informatization of the administrative activity of the university – at present, the entire administrative – economic activity is informatized, there existing a financial – accounting management program, namely EMSYS ([Appendix A21](#)), which has accounting modules, a material basis, purchases, human resources, research projects management and Aleph software, library management;
- building an informatized platform for the students' record – **Students Management**, which includes personal details and the data on the students' didactic activity, as required for the Matriculation Register. The students management system is an application hosted at the address <http://studenti.pub.ro>, which plays the part of recording and managing students within the University management system, of providing the e – support for the management of the studying programs, the contracts of study and of supplying an instrument for the management of all activities, including those that are specific to school status in view of drawing up the diploma supplement, namely the drawing up of the diploma upon graduation. One has implemented other additional functions, which facilitate the activity of the university personnel: generating catalogues; managing graduates; reporting at the UPB level; managing education plans; advanced selection filters for students, as per averages, number of outstanding examinations, number of credit points; managing accommodations ([Appendix A22](#)) . Each student may access his / her own account and may have access to the aforementioned information.

The activities carried out for the good operation of the information system are:

- periodical purchase of hardware, software licenses and annual maintenance services for the running of the administrative activity under optimum conditions.
- The establishment of the position of an information system administrator within every single faculty;
- The building of one modern communication infrastructure which shall provide for a communication capacity of 10Gbps, the most modern network within the Romanian academic space.



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During the period between 2007 and 2014, the university has followed the development plan included within the university development strategy. The major priorities of the university have been the rehabilitation, modernization and development of the material basis and the university patrimony.

As of 2008, the objectives of the university management have been adjusted to the new social – economic realities, with the purpose of reaching the development related objectives by attracting new finance sources, and particularly:

- The attraction and spending of European funds;
- The supporting and involvement of the university community within the activities carried out, and particularly in the running of POSDRU and POSCCE projects;
- Meeting the university community needs;
- Funds use efficientization;
- Complying with the legal framework and with the interim Bodies' procedures.

Administering the University POLITEHNICA of Bucharest is a complex process.

**Ref.2.** The University POLITEHNICA of Bucharest has an administration organized based upon the principles of one flexible and efficient management:

- **Continuity in the university evolution;**
- **Renewal and flexibility, as priorities – focused;**
- **Commitment for reaching the international university standards;**
- **Enhancement of the academic community spirit;**
- **Completion of projects, as proposed, while at the same time complying with the deadlines, as stipulated.**

The organizational chart of the university ([Appendix A23](#)) as posted on UPB website at the following address <http://www.upb.ro/organigrama.html> is periodically updated, by virtue of the Senate vote, in order to provide for a highly performing management.

The University POLITEHNICA of Bucharest develops a constant informatization of the administrative services, as well as of the didactic process, both at the university level and at the level of departments, faculties, the Central POLYTECHNICA Library and the research structures.

The administration of all compartments within the University POLITEHNICA of Bucharest is carried out based upon the legislation in force and the internal norms of the university ([Appendix A24](#)).

For the good operation of the education process, of the scientific research activities, of the management of projects with an external financing, the activities of the students' complexes of dwellings from Regie and Leu, the human resources and the university



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informatization, the Central POLYTECHNICA Library, the technical – administrative activities, the purchases and the unitary management of the secretariat activities within the university, as well as for the management and protection of the patrimony as well as of the financial resources, the University POLITEHNICA of Bucharest has within its structure the General Administrative – Economic Directorate (D.G.A.E.) of U.P.B.

The administrative structure of the university (DGAE) is run by a general administrative manager and is organized as per directions.

The general administrative manager has under his subordination all the university administrative structures which carry out the activities mentioned under the above point, it coordinates and is liable for the good patrimonial and economical – financial management of UPB, it carries out the strategic decisions of the UPB management in compliance with the legal provisions, it provides for the rational use of the university resources, it approves the hiring process within DGAE and it maintains the connection of the university management structures with the students organizations.

The General Administrative Economic Directorate operates based upon the Regulation for Organization and Operation ([Appendix A16](#)), as approved by the UPB Senate.

**Ref. 3. In view of simplifying and optimizing the administrative activities, one is working at the accomplishment of an integration of the existing information platforms and the development of new modules.**

## A.2 – Material basis

### A.2.1 Patrimony, equipments, financial resources, as allotted

#### A.2.1.1 Education, research spaces and spaces for other such activities

The university space is made up of: the overall buildings and lands, the university campus, any kind of equipments and having whatever destination, that are used within the university, regardless of the legal title under which the latter is entitled to use the same.

**Min.** the University POLITEHNICA of Bucharest has the largest university campus in Romania, which includes for each faculty, for each studying program, for every single research activity and for the administration, the necessary spaces, as required so that the said activity shall be carried out in compliance with the national and international standards. ([Appendix A25](#)).

The education spaces dedicated to courses and seminars are used by all studying programs, the latter's management being accomplished at the university level, and the education spaces for laboratory works are managed at the level of each and every single faculty, by the concerned departments. The endowment of the classrooms, the seminar rooms and the didactic and research laboratories is appropriate to the current stage of



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development of the scientific knowledge, being the level of the one from the partner European universities ([Appendix A26](#)).

The University has dwelling complexes in Regie and Leu, with 28 such dwellings and a capacity of 13046 seats and 6 canteens. Students accommodation in the dwellings is decentralized as per faculties and is informatized, there being ensured the necessary transparency. Each dwelling has lecture rooms, and the rooms have free Internet access and cabling. The administration of students' dwellings is carried out based upon a regulation ([Appendix A27](#)) as approved by the university Senate. For every single such dwelling, the involvement of the students in administration is provided by virtue of the Dwelling Committee, namely the Complex of Dwellings Committee, which are elected by the students.

The University POLITEHNICA of Bucharest has in administration a number of education spaces and dwellings, canteens, which are distributed within five immovable buildings, as follows:

- Immovable Noul Local, located on the land from no. 313 Splaiul Independenței Street, with an area of around 60 ha, with 46 buildings designed for the faculties of an electric, mechanic profile, the science of materials, transportations, biotechnical systems engineering and general education;
- Immovable Polizu, located in 1 – 7 Polizu Street, having an area of 3,7 ha and which includes 17 buildings designed for the faculties of Applied Chemistry and the Science of Materials and Aerospace Engineering and Medical Engineering;
- Immovable Calea Victoriei, located in 149 Calea Victoriei Street, having an area of around 0,4 ha and which includes 4 buildings designed for the faculties of Applied Chemistry and the Science of Materials;
- Immovable Leu, located in no. 1 – 3 Iuliu Maniu Blvd., having an area of around 8 ha and which includes 12 buildings, of which 4 are designed for the Faculty of Electronics, Telecommunications and Information Technology and partially, to the University of Bucharest and the Romanian Academy, 2 buildings are for students accommodation, the rest being auxiliary – household buildings;
- Students Complex of Dwellings in Regie, as located in 290 Splaiul Independenței Street, having an area of around 13 ha, and which includes 26 dwellings and 3 canteens, of which one is in capital repairs.
- In addition to the education spaces, the university also holds household spaces, lands and sports rooms, as well as newly acquired lands by means of transfer, as follows:
- Greenhouses in 55 Fabricii Street, having an area of around 3,65 ha;



- Sports basis in 7 Alexandru Ivasiuc Street, having an area of 2,15 ha; a land in 42A Geniului Blvd., having an area of 1.717 mp as obtained by transfer from the Ministry of National Defense.

At present, the lands of the University POLITEHNICA of Bucharest sum up around 91 ha and the existing constructions, which are registered in the Land Book.

The University POLITEHNICA of Bucharest has established the development plan included within the university strategy and the investment plans, starting from the envisaged incomes. The relevant priorities have been the rehabilitation, modernization and development of the material basis and of the university patrimony.

**Ref. 1:** During the period between 2007 and 2012, the priorities have been the rehabilitation and modernization of the existing material basis and of the university patrimony.

The investments that have been promoted and completed, have been the following:

***I. In the field of consumptions efficientization and the provision for energetic independence***

- Efficientization of the consumption of utilities, by the rehabilitation of thermal points (4 thermal points in Noul Local –PT Polizu - and PT3 Regie);
- The accomplishment of one own source of electric and thermal power for the university – building the Electric and Thermal Station with Co - Generation – as started up in 2010;
- The rehabilitation of the thermal network in Noul local;
- The thermal rehabilitation of the buildings;
- The rehabilitation of street lighting inside the university;
- The rehabilitation of the gas network;

***II. Major investments in the education spaces and in the modern didactic means for the laboratories endowment***

**1) Central Library** – as accomplished in 2012, in the area in plane of 3.120 sq. m. and the gross area of 17.670 sq. m.;

**Specific data**, as related to the space designed for the library:

- Lecture rooms with free access to the shelf;
- Reading rooms
- Room for informatized documentation;
- 10 storage rooms: over 2.000 sq.m. as area and over 14.000 linear meters in shelves.

**2) Consolidation of Section F-Polizu (as completed in 2008)** – the built up area of 1152 sq. m. and a gross area of 6267 sq. m.;

**3) The rehabilitation of the building section CJ** from Noul local (as completed in 2010 – the arrangement of education and research spaces for the Faculty of Engineering in Foreign Languages;

**4) The rehabilitation of the Amphitheatre AN 010- Radu VOINEA** – one has accomplished an endowment with cutting edge equipments (simultaneous translation cabins, sound and projection installations, ventilation installation) and modern furniture;

**5) The rehabilitation of amphitheatres, classrooms, toilets, terraces and laboratories at all faculties**, in the amount of: year 2007 – 8.066.000 lei, year 2008 - **8.472.000 lei**, year 2009- **3.081.000 lei**, year 2010 - **4.417.000 lei**, year 2011 - **2.068.000 lei**, year 2012 - **24.000.000 de lei**, year 2013- **approximately 24.000.000 lei**;

**6) The rehabilitation of dwellings in the students dwelling complexes from Regie and Leu** – At the end of 2007 one has completed the rehabilitation works at all university dwellings – 28 dwellings in the area of 87.363 sq. m.; all rooms within such dwellings have been connected to internet and interphone;

**7) Increase campus security** by mounting video cameras that are connected to a monitoring dispatcher and the renovation of the surrounding fences;

**8) The accomplishment of the Center for Students Recreation** which includes one fitness room equipped with highly performing equipments and lecture rooms. ( in Regie complex) **by the** rehabilitation and transformation of the former building of the laundry room.

**9) Rehabilitation of the laundry room in Leu dwelling**, and its endowment with modern equipments;

**Ref. 2:** For the period between 2012 and 2014 the priority has been to carry on the rehabilitation and modernization of spaces, with a significant emphasis being placed on the promotion of several projects of new investments in view of developing the material basis and the university patrimony.

## I. Rehabilitation works

- a) **Consolidation of Polizu Wing A** (finalized in 2013) with a gross built area 725 square meters and a floor area of 2900 square meters
- b) **Connection to the drinking water pipeline DN 315 – Bdul Iuliu Maniu nr. 6** – investment completed in 2013;
- c) **Rehabilitation of students and Rector Department staff cafeteria** – completed in 2013.



## II. New investments objectives (Appendix A28).

### a ) UPB Auditorium

In 2012, efforts were made to promote investment worth 44,047 lei. The auditorium will have 1,100 seats, a built area of 1982 m<sup>2</sup> and a floor area of 5004 m<sup>2</sup>. The building is designed to cater for several functions and, as such, in addition to the main conference room function, it may be used as performance hall (theater, concert) and cinema hall. The auditorium will be used by **both the academic community for national and international conferences**, and **for social-cultural activities carried out** not only by the students of the university, but also by students from other higher education institutes in the University Center of Bucharest. At end of year 2014, 80% of this investment was implemented, with the full completion due August 2015.

**b) The Advanced Research Center for Materials, Products and Innovative Processes - CAMPUS**, co-financed by the European Regional Development Fund under the financing contract no. 425/1/12.18.2012, with completion deadline in 2015, is an investment totaling 73,410,712 lei, of which the grant accounts for 59,767,690 lei. The building, with an area of 8644 square meters, will be a modern, green and, at the same time, a smart structure, comprising over 41 research laboratories equipped to European standards, workspaces, offices, conference and presentations rooms and technical areas. The center will promote an intelligent environment of control, integration and coordination of multi- and interdisciplinary research groups within the UPB. With this objective, UPB aims at increasing and diversifying its innovative offer and stimulating the access of enterprises to the results of the research, development and innovation work of the university.

**c) The Research Infrastructure for the Development of Intelligent Innovative Products, Processes and Services – PRECIS** is a construction built under a project co-financed by the European Regional Development Fund and has a total value of 49,219,137 lei, of which the grant is worth 40,000.000 lei (the funding contract was signed in 2014, and the deadline for completion is 2015).

The building will have a total of 28 advanced research laboratories, equipped with R&D equipment of the highest standards of performance; it will be a building with a modern architectural design, fitted with facilities specific to intelligent buildings and with spaces dedicated to interaction with the business environment and to idea incubators.

- **Ref.3** – The Development Plan for 2015-2020 sets forth the following major investments:
- A building for educational and research facilities, dedicated to the Faculty of Aerospace Engineering and the Faculty of Applied Chemistry and Materials



Science;

- Water supply to the University, from underground water sources - an investment worth 12,520,000 lei. A feasibility study was prepared; technical and economic indicators were approved by MEN. In September 2014, the design and build contract was concluded for the first phase of the investment - Leu Complex.

Modernization of the Regie Student Campus – the Development Master Plan ([Appendix A29](#)) to the year 2020, which covers the construction of new student hostels, replacing the ones built in the period 1960-1970. The first steps have been taken, consisting of the preparation of the feasibility study for the first student hostel, which will be a GF+8 Storey building, totaling an investment of 24,150,000 lei; the technical and economic indicators relating to this investment were approved by MEN in 2014.

- Rehabilitation of the “Leu” Canteen;
- Rehabilitation of the Student Hostel D;
- Building a swimming pool.

#### A.2.1.2 Fit-out

University POLITEHNICA of Bucharest has a very substantial investment program for the development of its facilities.

**Min.** In order to assure high quality, student-oriented education, UPB is equipped with adequate facilities for learning, teaching and communication, specific to a modern education process. Thus all auditoriums are equipped with multimedia, which enable implementation of up-to-date teaching methods, and all departments have their own laboratories, specifically fitted with appropriate equipment for the disciplines in the university curriculum, as well as with computer rooms connected to the Internet.

Upgrading the laboratories has been a constant preoccupation of the management of each faculty and of the Administration, with lab these facilities being described in detail in the self-assessment reports for the study programs.

**Ref.1.** The situation regarding the equipment of classrooms and seminar rooms show that they are fitted with the technical equipment that facilitates communication and teaching. Laboratories serving the subjects in the study program curricula are provided with equipment, IT systems and equipment to European standards and in line with international best practices ([Appendix A26](#)). Every department has at least one IT lab; all student hostels are connected to the Internet. The software has been purchased with related licenses and is specialized by fields of study.



**Ref.2.** An important part of the financial resources under the university's research contracts are allocated to the fit-out of the laboratories of the university, to increase research performance and thereby the reputation and prestige of the University. Also, the equipping of the university labs with top of the line technology designed to create research centers that are accredited to conduct technical certification and expert's appraisal activities, along with approval of technologies and industrial products, is a top priority for UPB.

Purchases of research facilities are employed in the teaching process, especially for the writing of diploma dissertation and doctoral theses.

The investment process started at the University POLITEHNICA of Bucharest will be continued by:

- completion of investments started;
- development of new investment objectives, including by means of public-private partnerships and attracting funds through competition;
- rehabilitation and modernization of existing spaces;
- fit-out of the teaching and research laboratories;
- development of badge-based services (for access to library, dormitories, canteens, recreation centers etc.).

**Ref.3.** UPB plans to enlarge and diversify its innovative offer by developing multi- and cross-disciplinary research laboratories under the investment objectives CAMPUS and PRECIS, as well as by means of the facilities built under the other projects financed from EU SOPCCE funds ([Appendix A30](#)). The goal pursued is to transfer the results of the University's research, development and innovation works to the social and economic environment.

### A.2.1.3. Financial Resources

**Min.** The financial resources of the University POLITEHNICA of Bucharest are included in the University budget, which is approved annually by the University Senate ([Appendix A31](#)), with the financial policies of the university being focused on ensuring sustainability.

All the funding resources of the University come from its own revenues. The University may also receive donations from the country and from abroad, in accordance with the legal provisions in force. The University's own revenues consist of amounts allocated from the budget of the Ministry of Education and Research, under contracts, covering basic, complementary and additional funding, building investment objectives, funds allocated by competitive funding for institutional development funds Inclusion allocated based on competitive biddings for institutional development, funds allocated through competitive bidding for inclusion, student scholarships and welfare funding, as well as from other gains incurred by the University from carrying out commercial activities, including European funds,



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interest gains, donations, sponsorships and taxes charged under the law from natural and legal persons, Romanian and foreign, and from various other funding sources. All these revenues are rigorously planned and used by the University, in strict compliance with the principle of university autonomy, for the planning and defining of its investment and financial policies.

**Ref.1.** The University's management strategy has constantly aimed at increasing the University's own revenues and achieving the balanced management of financial resources, the direct control of the expenditures and the effective administration of the assets of the University.

The annual budget execution ([Appendix A32](#)) is approved by the Senate and posted on the University website at <http://www.upb.ro/>.

University POLITEHNICA of Bucharest spends its funds based on clearly defined methodologies and procedures, developed in accordance with the relevant laws in force, such spending being subject to internal and external audits.

#### **A.2.1.4. Scholarships and other Forms of Support Granted to Students**

In addition to the concern to ensure the comfort and security of the University campus, an important preoccupation of the University management has been the defining of the scholarship granting policy. Stimulation of the teaching activity and performance has been the major goal pursued by the University when determining the amount of scholarships granted to its students.

In this regard, starting with the academic year 2012/2013, the Senate of the UPB decided to increase the amount of scholarships. Thus, scholarships were increased as follows:

- outstanding performance scholarship - 600 lei;
- merit scholarship I - 450 lei;
- merit scholarship II 2-350 lei;
- social support - 250 lei.

University POLITEHNICA of Bucharest grants scholarships to its students in accordance with the regulations in force and with the provisions of the University's Scholarship Granting Regulation ([Appendix A33](#)), approved by the University Senate.

Scholarships are granted from budget allocations and from the University's own funds. The Scholarship Granting Regulation is discussed with the students, approved by the decision of the Senate and reviewed on a regular basis.

**Ref.** The University grants from its own revenues scholarships, awards for outstanding achievements, awards to top graduates, and additional support to students enrolled in EU



mobility programs, scholarships to students involved in campus activities, as well as other special scholarships.

One of the major concerns of the University is the attraction of financial resources to supplement its scholarship fund. Since 2008, scholarships and grants have been awarded under SOPHRD projects, in amounts higher than the standard UPB scholarships.

For doctoral students who were not included in SOPHRD projects, the University has supplemented from its own revenues the amount of scholarship granted by the Ministry, so that every recipient of a scholarship, who is enrolled in doctoral studies, should receive a total scholarship of RON 1,500 /month.

The UPB's policy also plays a particular importance to other forms of financial support for students, as follows:

- free accommodation to students whose parent(s) is/are teachers
- free accommodation to students from orphanages and to orphans of both parents
- smaller accommodation fee for students coming from disadvantaged environments
- smaller accommodation fee during internships

A number of 15-30 students are receiving the Olympic Merit Scholarship granted by the MECS throughout the entire duration of their studies.

## B. EDUCATION EFFECTIVENESS

### B. 1 – Content of the Curricula

The educational process at the University POLITEHNICA of Bucharest is based on a long-term strategy, oriented on the following objectives:

- Preparing graduates in accordance with the requirements of the labor market in terms of their qualifications and skills acquired during their studies;
- Preparing graduates in such a way as they may acquire a sufficiently high degree of flexibility to be able to cope with any structural changes that may occur in the labor market over their careers;
- Develop educational resources designed to transfer new skills to people who have already graduated from a form of higher education, to enable them to adapt to the changing requirements of the labor market;
- Stimulate the students' creativity and their innovation capacity.



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## Education Content

Academic environment is currently undergoing a continuous process of transformation and globalization, following the reconsideration the social function of higher education by the transition from elite education to mass education. Students are therefore becoming the most valuable asset and resource and the center of all the preoccupation of the University, with the education process being constantly focused on satisfying their best interest.

Students' personal development is one of the targets aimed at by virtue of the objectives proposed by the university, by increasing the quality of the academic, social and cultural services that are provided to students.

By the action of developing the university in the latter's relations with its students, as direct beneficiaries of the educational services, the strategy approved by the UPB Senate is mainly aiming at:

- (1) Maintaining and developing the competences in fundamental and engineering sciences, which are vital for a sustainable technological development;
- (2) creating cross – cut competences, in view of facilitating the mobility of students on the European labor market;
- (3) Active orientation towards the formation of *soft skills* and social and relational competences, complementary to the formation of cognitive skills;
- (4) Students' personal development, so as to be able to acquire more autonomy, originality, creativity and capacity of communication as well as entrepreneurial spirit, the capacity to draw up strategies and policies, as well as the formation of abilities for the adjustment to new situations;
- (5) encouraging the learning of foreign languages within a nowadays context, for the perception of cultural specificity and specific communication.
- (6) Re – dimensioning of the institutional educational policies in relation with the dynamics of the labor force market in Romania and in Europe, by collecting the official data supplied by EUROSTAT or INS;
- (7) Diversifying the program for the university internationalization, including by encouraging students' participation in programs of professional mobility, which provide them with the contact with new and distinct learning experiences, by common studying programs, scientific collaborations within European programs, as well as the encouragement and supporting of the students' taking part in the national and European dialogue, by activating in the profile organizations from this level;
- (8) Encouraging extra – curricular activities, by collaborating with students' organizations and associations within the university and non – governmental organizations from the public and private sector. To this end, the career-related events organized within the university, with the



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latter's participation, have stood for the adequate context for the sharing of good practices which may define the planning of a successful career.

National and international competition amongst universities, the non-university higher education offers provided by private companies which, thanks to their flexibility and efficiency, are capable to meet specific needs of the students, are **major challenges** for the academic community.

Establishing new curricula and new departments have led in recent years to a raise in the number of students of the University, while the quality of the candidates has steadily increased as well. A priority for UPB has been and continues to be that of **recruiting talented students** with solid knowledge of sciences, including by attracting students from other countries, based on carefully devised admissions strategies and in accordance with the relevant laws in force.

A strategic goal of the academic activity management is to **maintain and develop further the educational offer** by bachelor, master and doctorate cycles, so that the offer may become **attractive and competitive** not only at regional and national levels, but also across Europe.

Among the actions taken and taken note:

- valorization of opportunities identified to improve the quality of curricula with current development potential, as well as actions for the development of curricula to satisfy future educational interests;
- permanent revision of curricula in accordance with standards specific subject content of curriculum renewal;
- enhancing curriculum's flexibility and degree of adaptation to market requirements by increasing the number of optional study subjects;
- developing courses with a subject-specific approach, enabling quick responses to the job requirements;
- developing practical applications to meet the actual needs of production, economic and financial and administrative environments;
- promoting actions designed to strengthen the skills of the students in terms of integrated team work, critical and creative thinking;
- increasing flexibility in terms of horizontal mobility of students;
- increasing the share of student's individual learning activities
- organizing bachelor and master degree internship by means of projects financed from European funds.



A particular importance has been given to increasing the amount of investment in equipping the labs of the University, the fitting-out and rehabilitation of its education facilities and the computerization of its teaching and assessment operations.

University POLITEHNICA of Bucharest provides through its departments (Appendix A3):

a) **bachelor's degree studies**: organized into 87 study programs in 17 scientific fields (Appendix B1);

b) **master degree studies**, structured by 22 scientific fields and 177 Master's degree programs, respectively (Appendix B2):

c) **doctoral studies**, organized in 14 doctoral schools; (Appendix B3):

d) **continuing higher education**.

UPB Senate approves regularly the regulations on the organization and running of the study cycles (Appendixes B4, B5, B6, B7), posted on the UPB website at <http://www.upb.ro/studii-master.html>, <http://www.upb.ro/doctorat.html>

and [http://www.upb.ro/files/pdf/Admitere2013/regulament\\_postuniversitar\\_final.pdf](http://www.upb.ro/files/pdf/Admitere2013/regulament_postuniversitar_final.pdf)

## I. Initial Education

The University has assumed the role of contributing to the development of the European Higher Education Area, with one of the priorities being the increase in education quality in all the three cycles, i.e. undergraduate, master's degree and doctorate's degree, including by developing its own criteria and standards and by the undertaking of accountability by the entire academic community of the University.

In this respect, for the *undergraduate studies*, the following objectives have been pursued:

- orientation of the content of the educational disciplines towards vocational and creative thinking priorities;
- ongoing renewal of the content of the scientific disciplines in the curriculum;
- increasing the share of study subjects with a comparative approach and an international perspective;
- reviewing the content of disciplines oriented towards operations, methods and techniques, by placing a higher emphasis on the practical and operational side of the knowledge transferred and on training in project management;
- introduction of educational activities that are meant to increase employment chances and the setting up of start-ups, spin-offs etc.

Also, each department and each specialty has:

- correlated and has validated interdisciplinary the draft university curricula;
- improved the quality of the courses taught by permanent updating of information;



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- has aimed at stimulating students' interest for individual study and research work, by increasing the share in the evaluation of the activities conducted during the semester;
- expanded inter- and multidisciplinary profiles in order to avoid narrow specialization, which could create difficulties to graduates in finding jobs suitable to their education;
- increased the practical and applicative features of seminars, projects and lab works;
- pursued a closer link between teaching and practice and the actual needs of the market economy;
- rethought and restructured its practical activity;
- increased investment in educational facilities, for the smooth running of the education and scientific activities (lab refurbishment);
- developed new undergraduate and graduate study programs;
- provided, through optional study subject modules, the additional education in communication, entrepreneurship, marketing, career development etc.

**University POLITEHNICA of Bucharest is constantly updating its teaching technologies** by means of:

- computerization of the teaching and assessment system;
- expansion of eLearning in specialized disciplines;
- increasing the share of topics and subjects for which applied works are carried out in micro-groups;
- developing personal, teaching and learning skills, combining own experience and results with the new directions and guidelines at European level, adapting them to the specific local conditions;
- increasing flexibility in terms of horizontal mobility of students among different areas with recognition of credits already acquired;
- equipping classrooms and labs work with multimedia equipment and adequate teaching aids;
- promoting the practice of inviting prestigious teachers from other universities to deliver courses at the University;
- provide electronic education support to students, for all disciplines;
- increasing the share of ongoing training and evaluation throughout the semester;
- develop IT platforms for university students.

For the **master degree studies**, University POLITEHNICA of Bucharest has pursued the following goals:

- a) develop interdisciplinary master degree programs;



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- b) supporting master degree studies in partnership with undertakings, other public or private universities in the country or abroad (creating “joint curricula” and providing “joint degrees” to graduates);
- c) increase flexibility and degree of adaptation of the master programs to the demand of the labor market;
- d) orientation of the master degree programs towards advanced scientific fields;
- e) increase the performance of master degree programs by scientific research works.

Note should be made that in the period 2009-2 total of nine dual degree agreements were signed with prestigious universities in Europe ([Appendix B8](#)).

Practical work in both undergraduate and master degree studies plays an important part in capacity building in general and mainly in the development of the practical skills and abilities of university graduates and their better integration in the labor market. Therefore, special attention has been given to the organization of this activity and to the increase of the effectiveness of the practical works by establishing a new structure and increasing the number of undertakings willing to engage in partnership agreements with the University ([Appendix B9](#)).

In this respect, an important role has been and is still played by the attraction of the EU funds needed to provide financial support to this type of activity, with the UPB coordinating or acting as a partner in a total of 25 SOPHRD projects ([Appendix B10](#)).

For the **doctoral studies**, the University POLITEHNICA of Bucharest provides:

- a) approach to peak scientific and interdisciplinary fields;
- b) establishment and consolidation of doctoral schools by peak areas of scientific research in the university;
- c) development of co-guardianship doctorates with universities in the country and abroad;
- d) increase in scientific production enjoying national and international recognition;
- e) making the research results widely known through their publication in prestigious scientific magazines and through transfer to applications in the economy;
- f) provide support to doctoral students and their research works through projects financed by the University from European funds.

Doctoral studies represent the strength of the educational offer of the University. These studies are organized in the 13 Doctoral Schools of Studies in the departments of the University ([Appendix B11](#)). Thus, the scientific work of great relevance takes place mainly in the schools and doctoral studies and at the level of the research groups centered on major scientific personalities in the University, which increases the scientific performance for all the doctoral degree programs organized across the University. Particular attention was paid to



the development of co-tutorship PhD studies ([Appendix B12](#)) and to opening the PhD programs toward the business environment and to the approach by the PhD students of advanced and interdisciplinary fields of study.

The University has attracted by competition European funds, currently running seven SOPHRD projects of doctoral and postdoctoral fellowships ([Appendix B13](#)). Thus a number of 625 PhD students and a total of 110 postdocs have received study scholarships and were given the opportunity to undertake internships abroad and to participate in scientific events, which were representative for the specific field of their doctoral studies. The research conducted under these projects have resulted into publication of a total of 2094 articles in magazines and of 1982 papers published in the ISI indexed volumes of proceedings of various conferences or in different international databases ([Appendix B14](#)).

### Continuous Education

In addition to the fundamental mission of the initial education, the University POLITEHNICA of Bucharest is providing continuous education. University POLITEHNICA of Bucharest aims to become a leading provider of **continuous training** for the building of new scientific skills and upgrading the skills acquired during the initial training.

The **continuous training** pursues the following objectives:

- develop dedicated **institutional structures**;
- **ongoing diversification** of the continuous learning offer;
- open and distance learning using information technologies via the RoEduNet network;
- develop and implement **modular and flexible programs**, adapted to the educational needs of the students or to the demand of the businesses;
- use of information and communication technologies to render more flexibility to the learning and develop **distance learning and e-learning schemes**;
- provide flexible access conditions;
- openness towards industry or to the personal development needs, taking account of the major problems of the society, dealing with sustainable development, risk management, quality assurance and local and regional development;
- adapt education to the demands of economic operators and of the national and European laws.

At the University POLITEHNICA of Bucharest, continuous learning takes place in the University's departments, faculties and training centers, in accordance with the Regulation approved by the Senate ([Appendix B15](#)).



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The continuous training programs are diversified and require great flexibility to meet the immediate needs of the beneficiaries. The programs are initiated by the specialized departments or the continuous training centers, following implementation of projects financed from EU funds (SOPHRD) at the request of economic operators, agencies or ministries, and are endorsed by the Faculty Board and approved by the Senate.

UPB contributes to the local, regional and national development through its involvement in line with the community needs, offering specialization and skills development programs tailored to the labor market demand.

### Human Resources

Educational ideal is defined by the values, rules and objectives contained in the institutional practice. Organizational culture, traditions and human resources are the best approach to mitigating risks and increasing performance.

UPB's human resource strategy is driven by the following principles:

- promote academic **excellence**;
- promote an organizational culture based on **performance and honesty**;
- sustain **professional autonomy** in career development, including by participation to life-long learning programs;
- recruit and promote in taking up a **teaching career** the **most worthy** young people;
- encourage permanent **dialogue** with the whole community by involving it in decision-making;
- maintain and promote the **dialogue with trade unions**.

The lines of action deriving from the above principles are:

- (1) Stimulating outstanding professional results, rewarding excellence in education and research;
- (2) Identify new financial sources and use all legal mechanisms to make sure that salaries and other financial incentives are granted based exclusively on the results and merits of each employee;
- (3) Ensure a balanced remuneration of teachers so that they may gain a decent salary and enjoy a social status that matches the importance of the mission within the society of all the members of the academic community, which includes the teaching, research, support and the administrative staff;
- (4) Involve the staff in continuous education programs;
- (5) Create financial facilities for participation to undergraduate studies of employees of the University POLITEHNICA of Bucharest and their families;
- (6) Encourage and support national and international mobility of the teaching staff;



(7) Encourage active membership of the teachers and researches of the University in various bodies of the Ministry of Education and Scientific Research, such as the National Council for Attestation of University Titles, Diplomas and Certificates, the National Scientific Research Council, the National Council for the Financing of Higher Education, the Romanian Quality Assurance Agency for Higher Education etc.

(8) Encourage teachers and researchers to cooperate with professional bodies in the country and abroad;

(9) Create working conditions that comply with the relevant quality standards;

(10) Grant welfare support to academic community members with special needs;

(11) Ensure conditions for the professional development and advancement of the support teaching staff and the technical and administrative personnel.

To meet the exigencies, solutions were sought within the University, particularly through promotion based on a specific vacancy policy (Annex B16), which is posted on the University website at <http://www.upb.ro/jobs.html>, and by retaining (Annex B17) and motivating the existing human resources of the University, in compliance with legal requirements in force.

To this end, the University has tried to provide a balanced and decent retribution of its teachers. Thus, in early 2012, decision was taken to raise the teachers' salaries as follows: 12% for assistants, 10% for lecturers, 7% for associate professors and 5% for professors.

Supporting the promotion of young teachers in their career has been and continues to be a priority of the UPB's human resource policy.

The evolution in the UPB's staff in the period 2008-2014 is described in Appendix B18.

### B.1.1 Admission

UPB Senate prepares and approves each year, as required by law, the Regulation on the organization of the admission exam based exclusively on the candidate's academic skills.

The University POLITEHNICA of Bucharest has been permanently concerned with the quality of students recruited, which is why it:

- promotes its services among the best high schools;
- organizes weekend courses in Mathematics, Physics and Chemistry delivered by UPB teachers;
- has developed a skill testing program, available on UPB website for whoever is interested to become a student of the University;
- has developed a video lessons platform oriented on the subject covered by the Baccalaureate exam - Mathematics, Physics and Chemistry - [learningpark.ro](http://learningpark.ro).



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### B.1.1.1 Recruiting Policy

University POLITEHNICA of Bucharest makes public its offer of educational programs at the start of the academic year via:

- University website ([www.upb.ro](http://www.upb.ro))
- periodicals (newspapers, magazines, guidebooks for admission to higher education);
- the POLIFEST event ([Appendix B19](#)), held annually
- presentations at national colleges, technical colleges and specialized high schools;
- open door days, educational fairs and exhibitions in the country and abroad;
- competitions for students (Costin Nenițescu, Marcel Roșculeț etc.)

University POLITEHNICA of Bucharest promotes selection criteria based on **school performance** and on the **equal opportunities principle**.

Communication with those interested in the University study programs is ongoing.

### B.1.1.2 Admission Practices

Admission as a student of the University POLITEHNICA of Bucharest is open to high school graduates who have a baccalaureate diploma, for candidates to undergraduate studies, a bachelor's degree, for candidates to master's degree studies, and a master degree, for candidates to PhD studies.

Admission to the University POLITEHNICA of Bucharest is governed by the Regulation approved by the Senate and by Law 1/2011, as amended, and is subject to compliance with the General Methodology established the Ministry of Education and Research.

To sit for the admission exam as a candidate to undergraduate studies at the UPB, candidates are required to have a baccalaureate diploma. Admission is strictly based on the grades obtained by the candidate in the two written admission exams (a share for 80%) and on his or her results at the baccalaureate exam (a share 20%).

**Ref. 1. Admission of students at the University POLITEHNICA of Bucharest is subject to an exam designed to increase the competitive drive of the candidates and their desire to meet the exigencies of the admission examination.**

Admission to each study cycle is based on a set of criteria laid down in the regulations approved by the University Senate ([Appendixes B20, B21, B22](#)) published on the UPB website [www.upb.ro](http://www.upb.ro) , at the corresponding sections: Bachelor's degree, Master's degree, Doctor's Degree (PhD).

The University as a whole and its departments are engaging in promoting their image among high school students. To this end, the University organizes road tours, visits, joint



actions with high school students, to correctly inform them on their opportunities to study at the University.

For the interested high school students, the University has established a free training program for candidates to undergraduate studies at the University POLITEHNICA of Bucharest, which provides up-to-date training facilities, in the form of:

- a special online admission training program, available at: <http://admitere.ncit.pub.ro/moodle/> , where candidates may test their knowledge.
- a face-to-face training program at the University (on Saturday) in Mathematics and Physics.
- An electronic pre-enrollment, enrollment and admission exam system, available to candidates at (<http://www.admitere.pub.ro>) (Appendix B23)

Starting from 2014, the University POLITEHNICA of Bucharest has been running the project called “Scientific Expertise and Practical Skills for a Successful Career (CSAPCS)” under the SOPHRD program, whose goal is to develop a platform of video-collection containing the Baccalaureate curriculum for Mathematics, Physics and Chemistry. The platform was open to the target group consisting of 30 high schools totaling over 3,700 students, and is available at <https://www.learningpark.ro/> (Anexa B24). After a few days from its opening, the platform was accessed by almost all the 3,700 students.

**Ref.2.** UPB website also provides information for applicants from EU and non-EU countries (<http://www.upb.ro/studenti-internationali.html>). At UPB, admission and tuition of foreign students is subject to the relevant laws in force. Foreigners who wish to attend the courses of the University are required to file a “Letter of Acceptance” in the form issued by the Ministry of Education and Research in Romania, following a request lodged by them. Enrolment forms are available at the embassies of Romania in the candidate’s county of origin. The candidate is required to attach to the enrolment forms the following documents: a certified copy of the certificate of education, a certified copy of the birth certificate, a medical certificate and a copy of the passport.

For their registration, candidates are requested to submit their education certificates and their identity documents in original. Candidates may take courses in French, English, German or Romanian. In all cases, the candidate’s communication skills in the particular study language of his or her choice must be confirmed by a certificate of language proficiency or by a language test. At UPB, foreign students are given the possibility to enroll in a preparatory year to learn the Romanian language.



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## B.1.2. The structure and Presentation of the Study Programs

### B.1.2.1 Study Program Structure

**The University POLITEHNICA of Bucharest has redesigned its curricula in order to be able to transfer the skills and competencies that define one's professional career, in line with labor market demand, the overall priorities of the European Union's strategies and the standards imposed by the UPB itself.**

To provide graduates with the skills that allow them to find jobs fitted to their education and qualification, the University has made efforts to improve the quality of the courses taught, by ongoing updating of information and by expanding its inter- and multidisciplinary approaches, in order to avoid very narrow specialization, ensuring a closer link between teaching and practice and providing optional education subjects in communication, entrepreneurship, marketing, career development, accounting for a share of at least 10% of the total number of hours of learning cumulated by the student by end of the study program.

Each study program of the University is based on the matching of the outcomes of learning or of the research (in the case of master degree or PhD) with the academic qualification.

The structure and content of an undergraduate study program and a master degree program are set according to the internal procedures of the University, starting from the strategic directions specified above. The content of each study program is the responsibility of the relevant faculty and/or department of the University.

The Senate of the University approves the general and the specialized skills corresponding to each study program, as well as the standards dealing with the basic and the specialized education, providing the interdisciplinary correlation and validation of the curricula across the University.

**Ref.1.** Study programs are implemented through cooperation between faculties/ departments to and by facilitating the students' mobility within the University through the transfer and accumulation of study credits.

Each Faculty Board develops the curriculum of each study program, based on the general and specific skills, competencies and qualifications to be developed in students.

The teachers of every department prepare their specific Discipline Description Sheet, establishing the knowledge to be taught and assimilated and the skills and competences to be transferred by the relevant discipline, the content of each discipline, the performance evaluation procedure, the transferable credits and the study bibliography.

All the study programs are implemented under the law and are subject to internal evaluations by the procedures approved by the University Senate and to external evaluation conducted by the quality assurance agency, as required by law.



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**Ref.2.** The curricula of the study program is constantly updated by incorporating the latest knowledge in the field of study, as resulting from the scientific research works conducted at national and international level, including the University's own research projects.

Bachelor and Master programs are at the same time flexible and customized in terms of specialties, optional subjects, research programs for diploma projects and dissertations, number of ECTS credits allocated to each subject and through the dedication, vocation and the personality of the teachers of the University.

According to the Regulation on teaching activities students may choose, up to 15 ECTS, subjects from other study programs, including from other universities, so as to ensure complementarity in knowledge acquisition.

### **B.1.2.2. Diversification of the study programs**

**Ref. 1:** All Bachelor, Master and PhD programs are full-time programs. The university has a FILS faculty with teaching conducted entirely in English, French and German. Teaching in English is also provided for undergraduate and master students of other faculties of UPB.

Of a particular importance is the participation of the UPB in the internationalization of higher education by increasing its number of foreign students, including EU students.

**Ref. 2:** The study programs managed by UPB are updated on a permanent basis, in particular with the results of the University's own national and international research initiatives. This is, in fact, how the University can best capitalize on its own research activity.

### **B.1.2.3 Relevance of the Study Programs**

Between Romania's economic growth and the historical evolution of the University POLITEHNICA of Bucharest from a School of Surveyor Engineers to the higher education institution of today there are many links. This is why the University believes that I.C. Brătianu was right when he said that a country cannot develop itself without engineers.

Over the last 10-15 years, the University POLITEHNICA of Bucharest has restructured its undergraduate programs in terms of both scientific field and content. Fields of study have evolved towards interdisciplinarity, while content has focused on science and technology developments.

Every semester, the faculty committees review the transfer of knowledge to beneficiaries in terms of the results achieved in the bi-annual evaluation.



Also, each year, based on labor market trends, the University considers the reasonability of cancellation of programs which are no longer interesting to the labor market or to the younger generation.

During the last five years, the University has set up two new faculties – The Faculty of Medical Engineering and the Faculty of Entrepreneurship and Business Engineering and Management, plus 10 undergraduate programs and 20 master's degree programs, all oriented toward interdisciplinarity.

After each semester, students and employers are able to express opinions and criticism and propose changes in the curriculum.

Thus, following proposals made by employers, all UPB undergraduate programs include Communication courses.

This year, the University will consider initiation of the documents required for further undergraduate studies, such as Nutrition, Negotiation and Leadership in Engineering, Forensic Chemistry.

UPB academic community is open to continuous innovation.

For example, two projects of the Faculty of Applied Chemistry and Materials Science are worth highlighting: a product design, including the business plan, that can turn into a spin-off or a start-up upon graduation, and a project carried out on a theme proposed by an employer, which was successfully developed by a student and then presented to the employer, thus enhancing the student's employability.

Bachelor and Master Degree studies at UPB show several special features such as:

- **Develop of “dual degree” study programs** in partnership with prestigious universities in Europe ([Appendix B8](#));
- **Development of Master's degree programs** in partnership with economic operators, as, for example, the master degree program developed with:
  - Renault Technologies Romania;
  - IFIN HH designed to train specialists for the future research base Extreme Light Infrastructure (ELI).

**Ref. 1.** The attention paid internships:

- At UPB, internship is compulsory in both in the undergraduate and under the master degree study program;
- The UPB is the first university in Romania that introduced in the undergraduate education cycle a long-term internship consistent with the requirements in Europe. At the end of the third year of study, students carry out an internship of 12 weeks. For this purpose, more than 500 agreements ([Appendix B9](#)) have



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been concluded with economic operators; implementation of these internships has been facilitated by access to SOPHRD projects ([Appendix B10](#)).

**Ref. 2.** During the period 2010-2012 curricula was revised in order to enter the university qualifications in the National Register of Qualifications in Higher Education.

This approach, based on the strict correlation between the subject content and requirements of the qualification the relevant specialists were trained to obtain, in accordance with the requirements of the labor market, has involved the following steps:

- a) Description of program/field of study in terms of professional skills and transversal skills;
  - Definition of the name of the scope of study, study program and qualification level (bachelor/master/doctorate).
  - Select and analyze the qualification definition sources (COR, professional or occupational standards, marketing studies, predictable developments in the labor market etc.);
  - Select possible occupations for graduates of the relevant program of study;
  - Define minimum common competences that, for a certain period of time, ensure the successful performance of those occupations - compulsory basic skills for a given qualification.
- b) Identify, for each program of study, the correlations between skills and **content areas**, study subjects and their related credits;
- c) Develop the **curriculum** of the study program according to the competences that define the qualification;
- d) Develop the **subject descriptions** in accordance with the curriculum and the competencies defining the qualification.

In the **process of consulting employers**, information is requested on:

- Posts/jobs the employer can offer the graduates of a study program;
- The skills that the employer deems to be necessary to carry out specific activities of those posts/occupations;
- Opinions on the level of competence of the graduates hired immediately after graduation and on their subsequent evolution at workplace;
- Considerations and suggestions on how the university curriculum corresponds at present with the labor market requirements;
- Examples and suggestions for actions by which the employer (individually or at branch/sector) proves its interest and involvement in graduates' insertion immediately upon completion of their undergraduate studies;



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- Training programs the employer makes available to staff.

**Ref. 3.** Mechanisms and tools have been developed and put in place for obtaining feedback from students and graduates ([Appendix B25](#)), aimed at continuously improving the performance level, including the periodic review of the study programs.

- **It was found that the introduction of the new internship system has resulted into a raise in employment rates among graduates in their field of study.**
- **The ratio between teaching hours and practical applications is balanced,** allowing the acquisition of practical skills based on theoretical knowledge. Master degree program contain a compulsory research component, designed to allow the development of students' creative and innovative spirit. Particular attention is paid to stimulating students' interest for individual study and research work, by increasing the share in the evaluation of the activities performed during the semester.

A significant part of the Master study programs have a strong inter- and multidisciplinary character, allowing the proper training and education of graduates.

UPB has acted to stimulate the internationalization of education, an approach proven by the following actions:

- Develop joint programs based on dual diploma agreements ([Appendix B8](#)) and on co-tutorship doctoral thesis in partnership with prestigious universities in Europe ([Appendix B12](#));
- Promote a large number of ERASMUS and ERASMUS MUNDUS type of agreements ([Appendix B26](#)), to stimulate international out-going and in-coming mobility of students and teachers. For example, in the academic year 2013-2014, a total of 132 students were enrolled in outgoing ERASMUS programs, 59 students for placement and 77 incoming international students;
- Agreements were closed with foreign institutions to finance international student mobility programs (ex. agreement signed with the **French Institute** attached to the French Embassy in Bucharest); ([Appendix B27](#));
- Attracting visiting professors from prestigious universities (e.g. Prof. Dr. Ulrich Heyder from Braunschweig Technical University, Prof. Dr. Leonhard von Dobschütz from Essen University);
- Arrangements designed to improve knowledge in various languages of international circulation and obtain internationally recognized certificates, which will facilitate the international mobility of students:
  - Agreement with the **British Council** covering delivery at the UPB of English language courses; ([Appendix B28](#))



- Agreement with the **Cervantes Institute** covering delivery at the UPB of Spanish language courses; ([Appendix B29](#))

UPB has in place a system, developed based on an internal methodology ([Appendix B30](#)), for the equivalence of studies taken in other universities, posted on the UPB website at [http://www.upb.ro/files/pdf/relatii\\_publice/Diverse/REGULAMENT-CRID\\_10.2012.pdf](http://www.upb.ro/files/pdf/relatii_publice/Diverse/REGULAMENT-CRID_10.2012.pdf).

Aligned to the current globalization trend, UPB is preoccupied to convey its renowned and distinct image within the global academic landscape.

Particular care is paid to bilateral cooperation agreements. Thanks to the international prestige it enjoys, UPB has a total of 181 cooperation programs with universities in 46 countries from Europe, America, Asia and Africa ([Appendix B31](#)).

### Life-Long Learning

In addition to its core mission of providing initial education, the University POLITEHNICA of Bucharest plans to become a leading **provider of life-long learning**, so that it may generate new skills and upgrade the skills acquired during the initial education.

To this end, the UPB provides the following services:

- **Postgraduate courses**

These courses are generally held at the request of economic operators. Course duration and its content are set according to the requirements of the economic operators and graduates are issued a certificate of participation.

- **Postgraduate courses for regulated occupations**

This course deals with the training for professions that are regulated by various national authorities. Course duration and content are established by regulations issued by relevant bodies. UPB has obtained authorization as a trainer in several of such jobs as, for example, energy auditor, energy manager, and ISCIR inspector.

- **Postgraduate courses aimed at acquiring additional skills to initial training**

There are courses that are approved by the Ministry of Education and Scientific Research, which allow participants to acquire recognized skills and credits. Upon graduation of this type of postgraduate course, the participants are issued certificates of competence.

UPB's strategy aims to strengthen these types of study programs in accordance with the current trends across Europe.



## B.2. Learning Results

### B.2.1 Valorization of academic qualification

An important element for a modern university that is oriented towards both the student and the labor market is the tailoring of its curricula to the needs of an increasingly competitive and open higher education market, to whose dynamic the University has tried to adapt. Considering all these facts, we believe that in recent years our University has proven to be dynamic and open to the new trends in higher education.

Numerous study programs have changed their name and content and new curricula (e.g. industrial design, industrial logistics, food engineering, air navigation, food control and expert's appraisal, biomaterials and medical devices, medical equipment and systems), and, as a result of partnership with economic operators, new master degree, postgraduate programs and continuing education schemes have been developed.

#### B.2.1.1 Valorization through employment in the labor market

As a result of strengthening its relations with the society and the social and business environment for a better insertion of its graduates in the labor market, has UPB managed to provide its graduates with the skills required to meet the demand of the labor market.

Employability of graduates depends on several factors:

- Training;
- Labor market stability;
- Economic and technological developments;
- The choice of the graduate to take up a career in his or her field of qualification.

The University is responsible for the content of the education, but also for appropriateness of the educational content to the changing needs of the labor market.

**Ref.1.** The permanent concern for modernization, adaptation and flexibility of its study programs have lead to a rapid insertion of the graduates of the University. The analysis of information supplied by the faculties and to the ALUMNI associations reveals that over 75% of the UPB graduates are employed according to their academic education and qualification within one year or less from their graduation



### B.2.1.2. Valorization of the qualification through postgraduate studies

The University POLITEHNICA of Bucharest, through its 15 faculties, offers undergraduate graduates the opportunity to complete their education by enrolling one of the 177 accredited Master's degree programs run by the University.

**Ref. 1:** Over 90% of the University's graduates of the bachelor's degree studies enroll in master's degree courses in the same specialty or in complementary fields. Graduates of master's degree studies have access to doctoral studies, with candidates being recruited mainly from the students taking up master's degree courses, who achieve promising results in research work.

#### B. 2.1.3. Students' Satisfaction

The University has mechanisms through which students can evaluate teaching, learning environment and the educational path. They have available a specific section on the Moodle Platform of the UPB and/or questionnaires developed by the management departments/faculties or by the teachers. UPB students have answered in recent years to the questionnaires sent in by the International Trendence Student Barometer. The presence of our University next to other famous European universities is important in terms of representativeness of the students' opinions about the end goal of the university studies. (Appendix B32).

These surveys show that UPB students are more satisfied with the quality of UPB teaching than students from other universities in Romania or from the European Union.

**Min.** Analyzing the answers of UPB students over a 3-year period, it has been found that 70% of them are satisfied with the language skills they acquire at the University, compared with 65% at national level and with the 54% European average.

The analysis also reveals that UPB students are satisfied with the interpersonal skills they can acquire during their university studies, which is at a comparable and even better than the European Union average. At the 2014 survey, students' satisfaction degree looks like this: academic reputation of the University (86.8%), University's reputation among employers (73.4%), University's IT facilities (62.9%), and student activities on campus (65.3%) .

**Ref.1.** The University is constantly preoccupied to ensure high quality, student-oriented education, performing regular assessment of students' satisfaction. Responses to questionnaires distributed to the students show that over 78% of respondents are satisfied with the learning and development environment and with the opportunities provided by the University for them to define their own educational path.



#### B.2.1.4. Student-oriented Teaching Methods

Academic environment is currently undergoing a continuous process of transformation and globalization, following the reconsideration the social function of higher education, by the transition from elite education to mass education. Students are becoming the utmost resource and the center of all the preoccupation of the University, with the education process focused on their best interest.

The validation of the success of this approach is the way in which the University, through its policies, strategies and results achieved, serves the interests of the student. Decision-making within UPB is exercised jointly with the students and for students, being centered on both the content of the teaching and on the organization of the teaching and teaching-supporting activities underlying the teaching process (profession and career counseling, IT services, medical assistance, libraries, dormitories, canteens, cultural, sporting, leisure facilities etc.).

Personal development of the students is one of the main goals pursued by the University, by designing student-centered learning methods and environments, with less emphasis on the mere transmission of information, coupled with enhancement of the quality of the academic, social and cultural services that are made available to students.

**Ref.1.** The teachers are specially trained in teaching at an academic level and are able to handle new teaching technologies (e-mail, Moodle Platform for study subjects, bibliography, resources in electronic format and communication with students, as well as the University's webpage), along with supporting teaching aids (from blackboard to overhead projector, flipcharts and video-projector). During the class, students are involved in the discussions by inviting them to ask questions, to participate in demonstrative experiments, with the teaching being adapted to their learning pace and methods.

Teacher-student relationship is based on partnership, each party having being accountable for the students' academic achievement, while learning outcomes are explained and discussed with them, insisting on importance of academic performance for their future development.

UPB's students benefit from an adequate learning environment, thanks to the many and adequately equipped learning and research spaces available at the University and the comfortable accommodation, research, scholarship and counseling facilities provided by the University. Study programs are intertwined with practice, placement and internship.

At UPB, there are some students with social or health vulnerabilities, who are treated with due care and respect. Teachers of UPB have the necessary skills and willingness to adapt



the knowledge transfer process to motivate these students to join in the process and become creative and innovative individuals.

**Ref.2.** By involving students in research activities and projects they are encouraged to discover and create knowledge, contribute to the development of technological innovations and adaptations in specific areas, in the context of sustainable development.

In the knowledge transfer process, the teacher and the student act as one team, fact that increases the effectiveness of the teaching-learning process, while enhancing the motivation of both the student and the teacher.

**Ref. 3.** The e-Learning platform of the UPB provides the electronic support for high quality education activities such as courses, seminars, lab works, transparent evaluation, feedback, teamwork, collaborative support to teaching and research and other specific higher education activities. The platform can be accessed at <http://www.curs.pub.ro>. The platform is used by all the students of the University, as evidenced by:

- Total number of accounts: 44.521;
- Total number of accounts which serve as faculty professor: 1,630;
- Total number of accounts which serve as student in the year 2014: 26,361;
- Facilities offered by the platform and a few statistics are presented in [Appendix B33](#)

### B.2.1.5. Students' Career Orientation

. **Min.** UPB teachers have established a program for providing tutoring services both during terms and during examination sessions. Tutors are appointed by student group/education year, which serve as the interface between students and faculty management.

**Ref. 1** UPB has set up the **Counseling and Career Guidance Center (CCOC)**, a structure that provides specific educational counseling and career orientation services, which is subordinated to the University Senate. The Counseling Center runs its activity by the principles of efficiency and high quality performance, being governed by the University Charter and the provisions of the CCOC's Regulation ([Appendix B34](#)).

CCOC's counseling and career guidance activity is primarily targeted to UPB students in every program of study, as well as to graduates and high school students in their final year of studies, who intend to become students of our University.

**The mission** of the Counseling and Career Guidance Center is to provide its students and graduates with specialized assistance and advisory services in developing those skills and competencies that are essential for finding the most suitable job. Thus, CCOC facilitates



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the social and professional integration of the students and graduates of the University, preparing them to take up the new employment opportunities in the labor market.

Counseling and career guidance at UPB has the following **general objectives**:

- provide guidance and counseling to high school/university students, to help them plan and manage their own educational path;
- decrease dropout rate amongst university students, caused by professional or career-related reasons and by personal problems or inability to adapt to the academic environment requirements;
- enable the smooth interaction between students and the labor market, so that students may get to know the real needs and challenges of the labor market;
- increase the employability of the students in their specific specialties.

**At every faculty level**, teachers involved in counseling act as tutors under the undergraduate and master degree study programs, advising students in choosing their specialization and educational path taking into account, inter alia, the information provided to the tutors by the advisers of the Counseling Center following analysis of specific evaluation tools, as proven by the individual vocational counseling reports.

This form of tutorship is reflected in each undergraduate and master degree program, respectively, by the assignment of a program officer/tutor, a teacher with specific responsibilities, in charge, among other tasks, with the communication with the students on issues dealing with educational counseling and the choice of specialization or of the most suitable study program.

Research strategy, objectives and themes are consistent at all times with the National Research Plans and with the European FP6, FP7 and HORIZON 2020 programs.

**Ref.2.** The collaboration between the experts of the Counseling Center, the faculty teachers within the University and the students has been validated in terms of its functionality and practical benefits under various projects funded from European funds, implemented at UPB, through which the three counseling levels are correlated as follows:

- *Level 1 counseling*, vocational counseling, conducted by CCOC specialists and focused on self-knowledge and identification of one's professional interests and aspirations;
- *Level 2 counseling*, educational counseling for choosing one's specialization, performed by experienced teachers from each faculty;
- *Level 3 counseling*, counseling for insertion in the labor market, which, by involving representatives of the university management and from the faculties, arrange for meetings between students and representatives of the business community, relevant companies active



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in the University's field of specialization, thereby ensuring the link between the University and the labor market.

This type of counseling allows for integration of all the specialized advisory services provided at University level, ensuring the collaboration between these structures (Counseling Center and faculties) to facilitate insertion of graduates in the labor market. The counseling work is governed by a specific internal procedure (Appendix B35). Peer tutoring is also a practice between senior students and freshmen.

### B. 3. Scientific Research

Scientific research is traditionally one of the components of the University's work, which has without doubt conferred national and international visibility and prestige to the University POLITEHNICA of Bucharest.

University POLITEHNICA of Bucharest is the first university in Romania present in the top 500 universities in the international SCImago Institutions Rankings (SIR) established by SCOPUS database – position 465 in 2013 (Appendix B36)

#### B.3.1 Research Schemes

Scientific research is the main knowledge and innovation process that ensures the dynamic of the core values of our University teaching activities.

**Min.** The University's medium and long term scientific research strategy is adopted by the University Senate and the governing structures of the departments define the research strategies on priority areas, in close relation with the study programs and oriented towards the harnessing and further development of available resources.

Strategic guidelines of the scientific research at all levels - departments, research centers, faculties and the University - are consistent with the fields and specializations of the current and future undergraduate and postgraduate technical education plans.

Each teacher is assigned a certain amount of research work, in accordance with the instructions and procedures of the University and the applicable laws in force (Appendix B37).

##### B.3.1.1 Planning the Research Activity

UPB has scheduled its research work according to priority research directions set at national and European and in line with the qualitative research evaluation criteria, thereby ensuring the constant raise in the competitiveness and visibility of its research, development and innovation initiatives.

The overall objective, which is contained in all the long-term strategies of UPB Senate and Faculty Boards, is to foster the advancement of science, technology and innovation in



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Romania, in order to increase economic competitiveness, with emphasis on continuous training, research infrastructure upgrading, articulation of major research programs, promotion of organizational excellence, increasing the quality of social life and the degree of public awareness of RDI in the context of European integration and globalization, seen as economic and social phenomena.

**Ref.2.** In 2012, the UPB Rector's Management Programme set as the strategic objectives of the UPB the following priority research themes under the European Horizon 2020 Program:

- health, demographic change and wellbeing;
- food security, sustainable agriculture, marine and maritime and research and the bioeconomy;
- secure, clean and efficient energy;
- smart, green and integrated transport;
- climate action, resource efficiency and raw materials;
- Inclusive, innovative and secure societies.

These objectives are closely linked to the “National Strategy for Research, Development and Innovation” for 2014-2020, which defines the following areas of smart specialization:

- Bioeconomy;
- Information and Communications Technology, Space and Security;
- Energy, Environment and Climate change;
- Green Nanotechnologies and Advanced Materials.

Smart specialization sustains reorientation of the RDI policies towards those research fields that deliver results of economic relevance. In this respect, UPB advocates:

- stimulation of a specific type of economic behavior, with regional or global ambitions and orientation;
- understanding the social impact of science, technology and economic activities in the relevant sectors;
- interdisciplinary research and development.

As such, smart specialization areas are open, in principle, to any scientific discipline.

Achieving the RDI objectives requires the UPB to take the following courses of action:

- preparation of human resources in R & DI;
- create the appropriate infrastructure for R & DI activities;
- internationalization of research



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## ***Training of Human Resources***

Taking account of the aforementioned objectives, the research in UPB has concentrated on the formation of joint research teams made up of PhD students, PhD graduates-doctoral supervisors-department specialists that have approached highly innovative topics of research. Examples of such initiatives are the SOPHRD projects, covering doctoral and postdoctoral fellowships. Thus, between 2009 and 2014, UPB has conducted a number of **7 SOPHRD projects (5 doctoral and 2 postdoctoral fellowships)**, see ([Appendix B13](#)), where the research work conducted by PhD and post-PhD students has resulted in a large number of articles being published in ISI-indexed magazines, in the volumes drafted for the proceedings of various international conferences. It is worth mentioning here the financial support allocated for participation in prestigious international conferences held in areas in which the UPB has defined its main strategic objectives through the year 2020.

In 2014, UPB began the successful development of 3 new SOPHRD projects covering doctoral and postdoctoral scholarships: “Human resources development through doctoral and postdoctoral research: a driver of the knowledge-based society (KNOWLEDGE)”, “Excellence in research through doctoral and postdoctoral fellowships (ExcelDOC)”, “InnoRESEARCH - Doctoral and postdoctoral fellowships in support of innovation and competitiveness in research”, covering over 300 PhD students and 150 postdocs, with research in interdisciplinary areas. The regular meetings held between PhD students, postdocs and leaders of research hubs have set the scientific collaboration topics and their aggregation in such a way as the interdisciplinary nature of the scientific research should prevail.

## ***Research Infrastructure***

The strong human resources development for support of scientific research in UPB has been accompanied by a massive development of the research infrastructure of the University, supported by POSS-CCE projects. In this respect, the two large-size POSS-CCE projects are currently implemented at UPB, which started in 2014, covering the construction and equipping of two new research institutes (CAMPUS and PRECIS), where fundamental and innovative research will be conducted through collaboration established at institutional level among teams of excellence specialists. A few other POSS-CCE projects that are now underway are planning to considerably enhance the facilities for scientific research in cutting-edge and high interest fields (e.g. food security, nanomaterials)

## ***Internationalization***

International competitiveness of the Romanian research, the presence in international markets of innovative products made in Romania and the global opening of the domestic R&D market are all depending on supporting the membership or the participation of



Romanian organizations to European or international initiatives, organizations and regional programs or infrastructures.

Some of the main actions of the UPB include:

- Supporting participation in projects under *Horizon 2020* Program;
- Supporting participation in European initiatives - Joint Programming Initiatives (JPI), the Joint Technology Initiatives (JTI)/European Innovation Partnerships (EIP) - and cooperation with third countries;
- Encourage participation in international organizations (CERN, ESA etc.);
- Creating synergies with centrally managed EU programs in RDI by “*twinning*” and “*teaming*” projects (in emerging centers of excellence, innovative regions and innovative clusters in Romania and in the EU);
- Establishing chairs (type “ERA chairs”) to attract leading researchers and academics;

Regarding the R & DI internationalization, the following aspects are worth pointing out:

- UPB is integrated in the international research - development – innovation networks, technology transfer networks and in competitiveness poles and innovative clusters networks. The UPB cooperates with the Fraunhofer (<http://www.fraunhofer.de/en.html>) network and became a member of the Danube TransferCenters network ([http://download.steinbeis-europa.de/ Presentation\\_DTC\\_roadmap\\_22.05.2041\\_Stuttgart.pdf](http://download.steinbeis-europa.de/Presentation_DTC_roadmap_22.05.2041_Stuttgart.pdf)) in 2013;
- UPB has an active role in the Extreme Light Infrastructure (ELI-NP) Project. In this project, the University’s representative is the technical manager.

### B.3.1.2 Research Implementation

The research of world-class results, whether they belong to basic or to applied research, depends on the management of the RDI activities capable of supporting scientific production. In this respect, the UPB has full institutional capacity to manage RDI activity, owing to its sufficient financial resources, modern facilities and its highly competent human resources.

In the period from 2007 to 2014, the research funds attracted by the University from participating in national and international competitions have amounted to: 903,096,422 RON, plus the funds secured under EU POSCCE-funded projects worth 63,878,227 RON.

At the UPB, scientific work is carried out through faculties, departments, Doctoral Schools ([Appendix B11](#)), research centers and the Department of Scientific Research



Management (DMACS). Every faculty is run by a deputy dean in charge with managing the scientific research within his or her faculty. The deputy dean handles both the contractual scientific research and the projects designed to attract and involve students in research work.

Research benefits from the facilities provided by the research centers of the University. The research facilities satisfy the education and training needs of the students enrolled in the accredited/approved study programs, while also enabling the development of experimental, basic (pure) and applied research. Funds for the enhancement of the UPB's research facilities are also attracted by means of POSCCE projects ([Appendix A 30](#)).

UPB has a total of 47 research centers. Access (<http://www.upb.ro/centre-cercetare.html>) to see the list of these centers as well as a brief description of the work of each center ([Appendix B38](#)). Establishment and operation of research centers is governed by a Regulation approved by UPB Senate ([Appendix B39](#)).

**Ref.1.** The University promotes a **an academic culture centered on research and on creating a favorable research environment**, where students are trained to become researchers in doctoral schools and are provided with SOPHRD fellowships and support for their participation in scientific events.

UPB has been present at numerous international invention exhibitions and has won a large number of medals and awards: 35 gold medals (including 3 with special congratulations from the jury), 8 silver medals, 1 bronze medal and 18 special prizes. UPB encourages the patenting of research results and is now the sole owner or co-owner of a total of approximately 115 patents or filed patent applications ([Appendix B40](#)).

In the period 2012-2014, a total of 134 research proposals were developed under the EU research programs. Besides, in terms of participation in national competitions, at the latest competition organized within the National Research and Development Program PN II, the UPB submitted a number of 622 research projects, of which 251 as coordinator ([Appendix B41](#)). The lists of national and European FP7 and Horizon 2020 projects proposed by UPB ([Appendix B42](#)) show that at **UPB research is programmed and implemented in line with the European and the global research framework**.

The University has a modern scientific research management system, characterized by specific structures, processes and methods for the planning, monitoring and control of the research results. **Procedures and software applications have been developed** to plan and evaluate scientific research at UPB.

By its newsletters (<http://www.upb.ro/newsletters/index.php>) (e.g. [Appendix B43](#)), the University makes known to the academic community in UPB, on a regular basis, information about European and national research competitions, at the address



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<http://www.upb.ro/competitii-aflate-in-derulare/index.php> , where updated and useful information is available about ongoing national and world competitions; besides, the UPB intranet page <http://intranet.pub.ro/index.php?page=55> supplies useful information and documentation for the drafting and submittal of research projects.

**Ref. 2.** In 2013, the *Department for Scientific Research Management* was reorganized. Currently **the work of this department is carried out based on procedures that are part of the UPB's quality assurance system (Appendix B44).** This way, the department's activity is consistent with the research quality standards dealing with organization, monitoring of research projects, and internal approval of research results and elimination of unfair practices. The Department comprises a specialized service dealing with transfer of know-how. This service provides technical assistance for patenting the research results, manages UPB's participation to invention fairs, liaises with economic operators that are potential beneficiaries of the research results.

Human resources involved in research are the teachers of the University. However, research projects and grants are implemented with the involvement of doctoral students, master's degree students and bachelor's degree students, as well as the auxiliary university staff (assistant teachers and administrative staff) in departments and central services of the university.

The UPB carefully monitors the evolution of research projects undertaken by its research centers, its faculties and the DMACS. The results of research papers are reviewed **by internal review boards**, including in terms of their compliance with the fair practices in research.

If any deviation is identified, UPB notifies the Commission of Fair Practices and Academic Integrity.

### **Ref.3. Excellence in research and close the socio-economic**

UPB has encouraged and supported research excellence by attracting permanent or temporary researchers trained in centers from other countries and by creating unique research infrastructure in Romania, that are competitive at regional and European level in the field of advanced research and are capable to provide the transfer of know-how and knowledge in this field between universities and businesses, by implementing the following projects:

In the period 2009-2014, special attention was paid to opening the University towards attracting new sources of financing for equipping its laboratories, creating unique research infrastructure facilities in major areas of interest for the social and business environment, along with attracting researchers with international experience and developing research teams within the university.



For this purpose, the University has conducted the following projects:

**1) New possibilities for sustainable integration of biodiesel production. Recovery of glycerol esters and omega acids.**

The project's general objective covered the creation of an infrastructure and human resource hub of scientific and technological competence at European standards within the University POLITEHNICA of Bucharest, in the field of **development of sustainable processes for the production of biofuels (biodiesel) and capitalization of by-products (glycerin, omega acids etc.)** through innovative processes (catalytic distillation, molecular distillation).

The specific objectives of this project included:

- Creation of an advanced technological process for obtaining biodiesel using different reactive catalysts to accelerate the transesterification;
- Creation of a technological process based on innovative processes (e.g. reactive distillation) for the use of glycerin resulting from biodiesel synthesis by multifunctionalisation, studying the influence of the multiderivatized glycerin on the properties of biodiesel;
- Creation of a technological process to separate from the biodiesel the omega acid esters of high economic value, thereby leading to enhancement of biodiesel properties;
- Creation at UPB of new research facilities (2D gas chromatograph, portable liquid-vapor equilibrium) and innovative research facilities (at lab and at pilot level), with research on the behavior and the scaling-up of the processes studied standing at the core of the proposals for innovative configurations of machines (reactive distillation, molecular distillation etc.);
- Preparation of a general methodology for the analysis and design of innovative processes and for the technological transfer of the project results (technology, designs, know-how) to an industrial partner (e.g., to IPIP Ploiesti)

**2) RECOLAND**

**The overall objective of the RECOLAND project** was the development of a multi-criteria decision-making system (information system) to **assess human health risk** and to use the system as a decision-making criterion in determining soil suitability in historically or accidentally polluted areas; identifying the optimal solution for remediation of soils contaminated with persistent toxic pollutants; cost analysis related to remediation of soils contaminated with persistent toxic pollutants (PTP) in relation with the remedial systems proposed and the establishment of land management and planning criteria for historically polluted areas in major industrial areas.



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### The specific objectives of the project covered:

- Enhance the institution's research and development capacity while fostering cooperation between universities and enterprises situated near important historically contaminated areas, whose destination is uncertain for the moment;
- Develop a decision-making tool for the planning of soil suitability taking account not only of the economic dimension, but also of the environmental and life quality components;
- Develop a team of researchers, who are competitive at European level, by involving in the team some junior researchers who completed their doctoral dissertations, postdoctoral thesis and training internships in the country and abroad, as well as university professors with extensive experience in the field and other specialists filling in the vacancies available under the RECOLAND project.
- Transfer of technology and knowledge in the relevant field between research institutions, i.e. universities in Italy, Sweden, Germany and France (where the management team members have graduated from doctoral studies and/made their internships).

### 3) Creation of the Center of Competence in Advanced Photonics and Biotronic

The main objective of this project was the creation of the aforementioned structure at the Faculty of Applied Chemistry and Materials Science, under the direction and coordination of professor Francois Kajzar, a valuable international expert with extensive worldwide recognition in the field.

#### Specific objectives:

- Establish the **management and scientific strategy for the creation of the Center for Research and Development in Biophotonics and Biotronic**
- Define the methodology for the preparation of compounds on the basis of chromophore functionalized DNA;
- Optimization and characterization of thin films of a high optical quality based on DNA, collagen, DNA - CTMA and other multifunctional materials with specific properties for applications in Photonics;
- Development of multifunctional biomaterials based on DNA and collagen for applications in photonic and biotronic devices;

### 4) SPFM technologies in ionic reactions of soil residual solutions and production of nanocomposites based on carbon nanotubes for energy and environmental applications (SPFM-LA).

The project's main objective was to create a SPFM (Scanning Polarization Force Microscopy) laboratory to successfully implement in Romania the **most advanced**



**nanometer scale surface characterization techniques**, equipped at the highest standard possible, and to produce in laboratory environment materials with unique properties.

Specific objectives of the projects included:

- implementation of SPFM (Scanning Polarization Force Microscopy);
- produce nanocomposites based on carbon nanotubes;
- produce 3<sup>rd</sup> generation solar cells based on carbon nanotubes;

Using these especially unique techniques in Romania during the research activities needed to achieve the project objectives it was possible to achieve scientific results of one of the biggest scientific value not only at national level, but also at international level, such as:

- measurement at nanometer-scale of the wetting angles of the liquid nano-droplets through the SPFM technique and finding their spatial distribution;
- characterization of micro and nanoscale corrosion using the SPFM technique;
- implementation of a variety of carbon nano-structures by pulsed laser ablation technique, i.e. graphene, nano-onions and single-walled carbon nanotubes;
- implementation of 3<sup>rd</sup> generation solar cells in lab environment.

**Ref.4 Create the research and innovation infrastructure required to meet the European exigencies and attract funding, mainly from the European Framework Program "Horizon 2020"**, a program dedicated to funding projects that are able to achieve technical, scientific, educational and social objectives and deliver results that can trigger actual positive changes in the life of the people.

In this respect, by its development strategy, the University has aimed to create a modern infrastructure. By completing the research projects financed from structural funds in progress, starting from 2013 the UPB will be ready for competitions to be launched; it will have state of the art laboratories and qualified human resources and will be able to undertake research in cutting-edge fields, with research results to be exploited by scientific papers, patents and technology transfer to businesses.

Ongoing projects dedicated to implementation of this objective are:

**1) CAMPUS – Center for Advanced Research on Innovative Materials, products and Processes**

Research works cover up-to-date topics in the fields of innovative materials, products and processes and are consistently integrated, thus promoting multi-disciplinarily and inter-disciplinarity.

Some of the topic of research include the research and development of new types of optoelectronic structures and circuits, research and development of new materials and technological processes, energy efficiency technologies, hydrogen-based technologies for energy production, innovative new techniques of machine-environment and human-machine



interaction, the development of new network solutions that pave the way for future Internet, production of microelectronic structures by flexible support organic deposition (polymers), atomic and nanometer-scale characterization of nanomaterials and nanostructures, development of technological processes required to manufacture new components and circuits based on innovative materials with nanometer structure, and so on.

Collaboration with industrial partners from the country and from abroad will promote innovation through technology transfer from academia to industry. The research results can thus be materialized in the form of services/products and used in the current industrial context thus contributing to technological progress.

- 3) **PRECIS- *Research Infrastructure for the Development of Smart Innovative Products, Processes and Services*** – the project's general objective is to expand the existing infrastructure and research activities of the Faculty of Automation and Computer Sciences in UPB, in order to achieve the technology transfer and develop the new generation of innovative products, processes and services to be used primarily in industry and healthcare. The center will be fitted with state of the art facilities and will cover the research topics that are consistent with the Strategy 2020 approached by the 28 laboratories, such as: Critical energy efficient processes and infrastructures, Robots for production processes; Complex Cyber-Physical Systems, Innovative processes and products designed to improve the quality of life, Humanoid robots and drones, Innovative products for mobile systems and services, Innovative services based on Cloud model, Innovative systems based Cluster and Grid Computing, eHealth services platforms, Applied Cognitive Robotics in Assitive Medicine, Virtual Reality, Innovation and collaborative building of computer-aided knowledge, Digital business ecosystems.

#### 4) **Creation of the National Food Security Center**

The project is dedicated to institutional enhancement of the National Center for Food Security by purchasing top R & D equipment comparable with the facilities available in renowned centers in the European Union. The Centre as a whole comprises over 100 types of equipment and techniques for the preparation, processing and analysis of various samples taken from packaging to food products as such, from precursors to finished food products and to chemical or enzymatic degradation products; from food products to dietary or medicine supplements.

The facilities built, some of which are one of their kind across Europe, enable the laboratory to perform multiple analyzes from sample processing to testing behaviour to aging or physico-chemical degradation, to routine or specific chemical analyzes. Some of the most



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important techniques, unique in Romania and at regional and European level as well, are listed below.

- determination in traces of metals as well as complex metal-based species;
- separation, identification and quantification of species of interest in food, biological samples etc., such as pesticides and their derivatives, additives, toxins, polychlorinated compounds etc;
- isotope ratios of the separate components - the technique is particularly useful in discovering forgeries, determining the origin of the samples, traceability etc.
- very specific analyzes such as changing of the tertiary structures/quaternary structure in proteins or other samples of biological interest;
- determination of the structural changes in samples due to heat treatment up to 300° C over scope wide enough to enable the analysis of a wide range of compounds.

## 5) NANODIS

**The project aims at expanding and upgrading the research infrastructure dedicated to nanotechnology** and proposes to take advantage of the knowledge and experience of the UPB in the design, production and characterization of nanomaterials and their applications in the fields of nanotechnology such as sensors, 3rd generation solar cells, MEMS (micro-electro-mechanical systems), MOMS (micro-opto-electro-mechanical systems), intelligent clothing.

### Research Results

Scientific research is traditionally one of the activities that has obviously contributed to the national and international visibility and prestige of the University POLITEHNICA of Bucharest. It is the main knowledge and innovation process behind the core values of the education activities of our University.

Therefore, the strategic directions of the scientific research at all levels - departments, research centers, faculties and the University as such - are consistent with the fields and specializations of the undergraduate and postgraduate technical education, current and planned.



The overall objective, which is contained in all the long-term strategies of UPB Senate and Faculty Boards, is to foster the advancement of science, technology and innovation in Romania, in order to increase economic competitiveness, with emphasis on continuous training, research infrastructure upgrading, articulation of major research programs, promotion of organizational excellence, increasing the quality of social life and the degree of public awareness of RDI in the context of European integration and globalization, seen as economic and social phenomena.

In the period from its latest institutional evaluation, the University has set priority research themes in accordance with the National Research Program and the European FP7 and Horizon 2020 programs.

UPB strategic objectives are oriented towards cutting-edge research fields, where the University achieves great results.

The University POLITEHNICA of Bucharest has implemented research projects financed under the programs: IDEAS, PARTNERSHIPS, CAPACITIES, INNOVATION, PD, TE, TD, HR, SSA, STAR, THIRD PARTIES, as well as from its own sources.

It is noteworthy that the reduction of the national research funds has led to a decrease in the number of contracts (from 1152 in 2008 to 522 in 2009, 556 in 2010, 211 in 2012, 237 in 2013, and to 350 in 2014) and in the amount of resources attracted from research programs. As such, the University was forced to switch to external programs and to programs financed from EU funds and research contracts financed by third parties. The number of European funded research contracts has therefore increased (FP7, Horizon 2020 ERANET, Eureka, ESA, CERN etc.), and so has the funding amount.

Research topics are consistent with the UPB strategy, with the research work and results of the last two years being presented in [Appendix B45](#).

The University POLITEHNICA of Bucharest is a member in several associative structures of competitiveness poles and innovative cluster type, such as:

- **Auto Muntenia Competitiveness Pole** (<http://clustero.eu/auto-muntenia-competitiveness-pole>);
- **IND-AGRO-POL** competitiveness pole (<http://clustero.eu/ind-agro-competitiveness-pole>);
- **ALL ELECTRIC** electrical competitiveness pole (<http://clustero.eu/electrical-engineering-pole>);
- **SIS-AUTOM-INT - POL** competitiveness pole (<http://clustero.eu/sis-autom-int-pol/>);
- **ELINCLUS** Cluster (<http://www.elinclus.ro/>);
- **MECHATREC Cluster** (<http://clustero.eu/regional-mechatronics-cluster-mechatrec/>).



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It is also worth mentioning the University's effort to raise funds under the SOPHRD and SOPCCE Programs

The SOPHRD projects were aimed at supporting scientific research by support provided to doctoral and postdoctoral students, in the form of doctoral and postdoctoral fellowships, funding of research internships abroad and of the equipment and supplies the students required for the research works related to their PhD theses.

Thus, the 111 HRD projects implemented in the period 2008-2014 had a financial contribution of 222,355,000 lei, and the 16 SOPCCE projects, which were also carried out between 2009 and 2014, brought to the University funds amounting to 63,878,227 lei.

Involvement of the research potential of the university implementation of the research projects with international funding placed the University POLITEHNICA of Bucharest on one of the top places in Romania in terms of number of projects won and the amount of funding raised.

The operative management of the research activities is ensured by the dedicated department DMACS and by the heads of the research centers, under the coordination of the deputy dean in charge with research works and of the chief administrative manager.

The summary of annual reports submitted to the UPB Senate specifies the indicators that reflect the degree of participation in research work. All these indicators, calculated by faculties/departments, have had stimulating effects.

### **B.3.1.3. Valorization of Research Results**

University POLITEHNICA of Bucharest has taken up the role of advanced research institution, a generator of knowledge, innovation and technological adaptations. The sustained efforts of the academic community of the University have acquired a nationwide strategic dimension and have boosted the country's scientific and economic sector.

UPB's research results are valorized as follows:

- during teaching courses, seminars and lab works;
- publication of articles in internationally indexed magazines;
- papers presented at national and international scientific conferences;
- dissemination to business environment;
- advisory services provided to the business community;
- patents;
- prize-winning products presented at national and international exhibitions and competitions;
- press conferences.



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**Ref.1.** University POLITEHNICA of Bucharest takes good advantage of its research activity by incorporating the research results into its teaching activities and in the promotion and internationalization of the University and its positioning at the top of international rankings, as well as by patents and scientific papers published in magazines indexed in the international Thomson and Scopus database, via ISI-indexed international scientific conferences, transfer of technology and creation of clusters etc.

**Ref.2.** The University ranked first at country level in 2009, 2010, 2011, 2012, 2013 and 2014 according to SIR World Report (Scimago Institutions Rankings), which is the widest ranking of research institutions worldwide. This ranking is based on SCOPUS database. Whether it is about universities or institutions focused exclusively on research, the SIR Report has evaluated the impact and the local, regional and global positioning of each significant research institution in the world. The latest edition of the ranking have included more than three thousand research institutions around the world, grouped into five organizational sectors and classified by the geographical region where they operate. An analysis of the ranking charts of the recent years ([Appendix B36](#)) indicates the position the University has managed to occupy at national, regional and international level.

Owing to the sustained efforts made by the academic community of the University and to the institution's highly skilled human resources, efficient resource management and, last but not least, the significant investment in equipment, laboratories and research projects, have turned the University POLITEHNICA of Bucharest into a nationally and internationally recognized authority in scientific research.

#### **B. 4 – Financial Management**

The account books of the University are organized according to the law and regulations governing the work of public institutions and are fully computerized and transparent.

The computerized Finance and Accounting Management System implemented between 2007 and 2009 manages the financial resources for expenditure commitment process, contracting, acceptance, payment authorizing, payments, sales and receipts.

The main objective is a powerful financial accounting management system designed to ensure compliance with the current legislation on the use of budget fund, by maintaining expenses within approved budget limits and maximizing the surplus.

One defining element of the financial management function is its strategy designed to assist with the implementation of grant-funded projects.



## B.4.1 Budget and Accounting

The University POLITEHNICA of Bucharest has an annual income and expenditure budget that is prepared by the Chief Administrative Director and, as of 2014, by the Finance and Accounting Department and approved by the Senate

University's management strategy has aimed to increase the institution's own revenues, achieve a balanced management of its financial resources, ensure direct control of its spending and the effective administration its assets.

### B.4.1.1 Income and Expense Budget

The structure of the budget component includes at the beginning of each financial year the estimated financial resources required to finance expenditure on the running of the activity, with income and expenses being backed by specific key indicators such as: number of students enrolled in undergraduate education, number of participants in postgraduate courses and master degree programs, number of posts actually filled in by teachers and other employees of the university, total wages fund, the University's facilities comprising classrooms, student dormitories, canteens and equipment and devices as are necessary to the University to run its core activity.

**Ref.1.** The application to the budget implementation of the relevant financial regulations on keeping expenditures within the approved budget and the compliance with the rules governing commitment, settlement, authorization and payment of expenses have been supported by management strategy, based on the principle of reality, legality, necessity and appropriateness of expenditure.

In conclusion, it is worth highlighting the fact that, in a period of economic difficulties, the management of UPB has succeeded to achieve a balanced management of expenditures and to maintain the goods standing of the University assets.

As regards the general budget (Appendix A31), salary expenses amounted to 207,750,845 RON of the total wages of 463,372,562.46 RON. The budget is sufficient enough to warrant a sustainable development.

The report on the budget implementation is presented in Appendix A32. The 2015 budget and the 2014 budget implementation are posted on the UPB website <http://www.upb.ro/>

Tuition fees, calculated as the average cost of tuition for the year 2012/2013, amounted to 4,000 RON/academic year for undergraduate studies, 4,500 RON for students at the Faculty of Engineering with Courses in Foreign Languages, and 5,000 RON/academic year for master studies. (Appendix B46)



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Starting from the academic year 2013-2014, according to the regulations on the organization and running of undergraduate and master degree programs, the following reexamination fees have been set:

- TD1 for students with maximum 2 reexaminations in two different disciplines;
- TD2 for students with more than 2 reexaminations, provided they graduate the study year;
- TD3 for students who fail to graduate the study year.

The amount of these fees ([Appendix B47](#)) is approved each year by the Senate and made public at [http://www.upb.ro/files/evenimente/ADMITERE\\_2014/Taxe\\_2014-2015\\_aprobrate\\_in\\_Senat.pdf](http://www.upb.ro/files/evenimente/ADMITERE_2014/Taxe_2014-2015_aprobrate_in_Senat.pdf). The use of these fees is made public together with the analysis of the budget implementation, with over 35 % of the proceeds gained from these fees being invested by the University in the development of its own education facilities.

UPB provides support (pay in installments, tax reduction) to vulnerable students.

The University POLITEHNICA of Bucharest owns 100% of its education facilities.

#### **B.4.1.2 Accounting**

The University's accounting activity is organized in line with the laws in force applicable to public institutions. Expenditures of the University are compliant with the relevant laws, with the revenues incurred and their destination and with the non-profit nature of the institution.

**Ref.1.** Accounting is computerized and permanently transparent. Financial and accounting management is run by means of EMSYS software. Financial information is presented to the UPB Senate.

Salaries, scholarships and student transport allowances are paid in the recipients' card accounts.

Accounting is further improved by the proper management of leases, staff management, computerized fee and fellowship management system etc.

**Ref.2.** The performance of the University is quantified by calculating the underlying financial standing indicators: liquidity, solvency and profitability. The analysis reveals the defining features of the UPB: robustness and complexity of assets, efficient use of assets and a high level of financial efficiency. Diversification of income sources has been an element of financial soundness, while the increase in revenues gained from the grants has prevented further cuts in incomes caused by budget austerity.

#### **B.4.1.3 Audits and Social Responsibility**

At UPB, internal audit of the financial activity is carried out in accordance with Law no. 672/2002 on internal audit, republished. External audit was carried out by the Court of



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Auditors in accordance with specific standards of public external audit. Balance sheet, budget implementation account and the results of the external audit of the financial statements of the University were presented to and analyzed at the meetings of the UPB Senate.

**Ref.1.** For all projects under the NPRDI, external auditing is conducted by an independent auditor. EU funded projects are audited by an independent auditor and by representatives of intermediate bodies, managing authority and audit bodies from the Court of Auditors and the European Court of Auditors.

## C. QUALITY MANAGEMENT

### C.1. – Quality Assurance Strategies and Procedures

To increase performance and achieve excellence in education and research, a priority concern of the management of the University POLITEHNICA of Bucharest is the implementation and development of the Quality Management System.

#### C.1.1. Quality Assurance Structures and Policies

The University POLITEHNICA of Bucharest has implemented the **Quality Management System** (QMS) starting from 2002. The QMS conceptual development in the sense of defining its organizational and functional structure and its integration into the strategic management of the University has been a top priority for the UPB.

##### C.1.1.1. Quality Assurance System Organization

**Min.** In 2002, the University POLITEHNICA of Bucharest established supporting organizational structures for QMS implementation, such as the **Quality Council**, at University level, the **Quality Committees**, at faculty level, and working groups at department level.

The extent of the roles and the relationships established between these structures and the structures in the University are described in the **Regulation on the UPB Quality Management System** ([Appendix C1](#)) and in the **Regulations on the Operation of the Quality Council** ([Appendix C2](#)), as well as in the Organizational Chart of the UPB ([Appendix A23](#)), all these documents being posted on the UPB website at: <http://www.upb.ro/managementul-calitatii.html>

According to Law no. 87/2006, approving GEO 75/2005 on Quality Assurance in Education, the University has set up the **Quality Assessment and Assurance Commission** (CEAC) and prepared the **CEAC Organization and Operation Regulation** ([Appendix C3](#)).



Besides, the University established the Quality Management Department (DMC) as a logistical support structure and developed the **DMC Organization and Operation Regulation (Appendix C4)**, these documents being available on the UPB website at: <http://www.upb.ro/managementul-calitatii.html>

At present, the following quality-oriented and quality promotion structures are existent at UPB:

- The Quality Council run by the Rector, composed of quality assurance specialists from UPB faculties and from outside the University and of students (Appendix C5);
- Quality Assessment and Assurance Commission led by the Rector via the delegated Vice-Rector (Appendix C6);
- Quality Commissions at faculty level, headed by Deans, through Quality Management Officers;
- Quality Working Groups, set up at department level, run by the Quality Management Officer of the Department;
- Internal auditor teams;
- Quality Management Service, a component in the UPB organizational chart.

The UPB is constantly interested in involving in the Quality Commissions, students, administrative and research staff, and representatives of the social and economic environment.

The quality management structures established at UPB are in charge with drafting the QMS implementation strategy across the University and submission thereof to debates at the meetings of the University Senate debate, developing within the QMS of system procedures for quality management, as well as with defining the quality requirements to be stipulated in Strategic Plan of the University (Appendix A 18).

The Quality Management System documentation developed at the University POLITEHNICA of Bucharest (posted on UPB website at: <http://www.upb.ro/managementul-calitatii.html>) includes a Quality Management Manual (Appendix C7) and system procedures, operational procedures and working procedures (Appendix C8), which operate in the UPB's education and research process. The reference standard chosen by UPB for its QMS documents is ISO 9001/2008.

**Ref.1:** Promotion by the Quality Assessment and Assurance Commission of a quality culture across the University started ever since its establishment and stipulated in the CEAC Organization and Operation Regulation (Appendix C3). To this end, and for the smooth implementation of the QMS, regular meetings were held between University teachers and various experts, as stakeholders of educational programs, during which the documents



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required by the relevant standards were developed and revised, for the proper running of the UPB's QMS.

**Ref. 2:** the Quality Assessment and Assurance Commission, together with the entire leadership of the university, establish qualitative and quantitative benchmarks in comparison with other universities in the country or from abroad, to assess and monitor quality. UPB is currently a partner in the SOP HRD/155/1.2/S/139950 Project "Improving the quality of the national higher education system in accordance with changes in the knowledge-based society and labor market dynamics". Under this project, a benchmarking was defined among the quality management systems in Romania and similar systems implemented by different universities in the EU, based on which a framework quality assurance manual will be drafted and proposals will be formulated regarding the QMS restructuring. Moreover, members of the teaching staff, Quality Council, CEAC and DMC have attended scientific meetings and workshops dealing with quality assurance.

**Ref.3:** CEAC, jointly with DMC, has organized training for internal auditors, university teachers ([Appendix C9](#)), to make known the provisions of the Quality Manual and the faculty quality management procedures, including the RQAAHE requirements for study program evaluation.

### C.1.1.2. Quality Assurance Policies and Strategies

UPB is determined to achieve excellence in education and research, which requires a culture of quality, developing a system of self-assessment and continuous monitoring, leading to permanent improvement of the institution's capacity to respond in a proactive manner to a changing environment.

**Min:** The quality assurance policy outlined in the 2012-2016 Management Plan ([Appendix A18](#)) and the Quality Policy Statement of the UPB Rector ([Appendix C10](#)), posted on the UPB website at: <http://www.upb.ro/managementul-calitatii.html>, prove the particularly important place the quality management occupies in the University's strategy and the full involvement of the top management in achieving quality objectives, while also defining the means to achieve such objectives:

- University integration into an **international evaluation** process, to increase its worldwide reputation and visibility;
- development of **internal self-assessment mechanisms and procedures** to increase the quality of all the activities of the University;
- regular **self-assessment** of bachelor, master and doctorate studies;
- participation in the **exchange of best practice and** of high performance academic **governance**;



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- promoting **transparency** of the quality of teaching;
- **annual evaluation** of teachers by **students**, through **self-assessment** and
- **peer review**;
- annual evaluation of **the results of the study programs**;
- presentation on the **University's website** of the information on the state of the institutional quality.

**Ref. 1:** Each policy is associated with specific implementation strategies, containing concrete provisions and deadlines. These are contained in the Strategic Plan ([Appendix A 18](#)) and in the Operational Plans for 2012, 2013, 2014 and 2015 ([Appendix A19](#)), published on the UPB website at: <http://www.upb.ro/managementul-calitatii.html>

**Ref. 2:** The Quality Assurance Policy and Strategy is presented to and applied by all the structures of the University through actions involving all members of the teaching staff, auxiliary teachers and non-teaching staff, research staff and students. A whole set of procedures are put in place for quality assurance across the entire institution, both in teaching and research and in the management process.

Thus, each faculty, in addition to implementing the quality assurance policies and strategies established at University level, has its own quality improvement policies, strategies and action plans.

CEAC prepares each year the Report on Quality Assurance and Implementation and the Action Plan for improving quality assurance, using, inter alia, the reports prepared by the Quality Management Commissions in each faculty of the University. At University, these documents are disseminated, discussed upon and subjected to approval by the Senate ([Appendix C11](#)). Reports are posted on the UP website at: <http://www.upb.ro/managementul-calitatii.html>

## **C.2. – Procedures for Initiation, Monitoring and Regular Revision of Programs and Activities**

### **C.2.1. Approval, Monitoring and Regular Assessment of the Study Programs**

Since its establishment, the University has been constantly concerned with adapting its curricula to world scientific and technological developments to the needs of the developing Romanian economy.

After 1990, owing to the opening of the University towards the European technical higher education and application of the principle of university autonomy, new areas of research have emerged, that have evolved naturally, leading to new study programs related in particular to environmental engineering, materials science, communications, computer



science and biotechnology. The faculties have adapted their names and curricula to match those in use in the European Higher Education Area and to respond to labor market requirements.

The University, by the Senate Committees, promotes analyzes by groups of disciplines, to harmonize, across the institution, training in certain areas. The analyses are then discussed by the University Senate, and actions are proposed to increase the quality of students' education in those particular fields of study.

Life long learning programs are diversified and show great flexibility in order to meet the immediate requirements of the stakeholders. Such programs are initiated by specialized departments or by the life long learning centers, usually at the request of businesses, agencies or ministries, and are endorsed by the Faculty Board and approved by the Senate.

The international cooperation of our University with over 140 prestigious universities from Europe, USA, Canada and Japan allows, in addition to the development of joint programs, the revision of the study programs in line with the experience of the foreign universities. Virtually all the faculties of the University have conducted their own analysis, to find the most appropriate forms of connection to the international higher technical education system.

### **C.2.1.1. Regulation on the Initiation, Approval, Monitoring and Regular Assessment of Study Programs**

UPB has developed and implemented tools that support optimization of decisions regarding the design, organization and implementation of study programs (curricula).

Initiation of new study programs, based on academic qualification requirements and labor market dynamics, requires justification of the decision making in terms of compatibility with similar study programs in the EU.

**Min:** The university has put in place the **Procedure on initiation, monitoring and regular assessment of study programs** (Appendix C12), which is part of the Quality Assurance Manual and defines the stages and the documents needed to promote a new study program, with core responsibility falling with the promoter Faculty Board and approval role resting with the University Senate.

**Ref. 1:** The Procedure regulates the manner in which study programs are monitored. The University has also defined procedures for evaluating education disciplines (Appendix C13) and the Procedure for assessing students' and other stakeholders' satisfaction (Appendix C14), all of which are posted on the UPB website at: <http://www.upb.ro/managementul-calitatii.html>

Based on evaluation questionnaires, faculty management teams gather information and data and determine the steps to be taken.



The Procedure regulates the regular assessment of study programs. The assessment is conducted by the Faculty Board at least once a year, both for the undergraduate (bachelor's degree) and for postgraduate (master's degree).study programs.

Based on the results of each study program, the Faculty Board may decide to review the curriculum and/or syllabi/subject descriptions.

The task of revising the disciplines syllabi is assigned to owner(s) of the relevant disciplines, in consultation with the specialized department and subject to approval by the Faculty Board.

Revision of study programs, which involves a change in several disciplines that are not exceeding 15% of the total credit points allocated to the program, is conducted at the initiative of the specialized departments and the BEF, following a review of the program, and is approved by the Faculty Board.

**Ref. 2:** Effective application of the Procedure regarding initiation, monitoring and regular assessment of study programs is based on internal structures and resources developed by the University, in charge with teaching processes and research activities.

### C.2.1.2. Equivalence of Diplomas and Qualifications

**Min:** Study programs and diplomas (Appendix C15) are prepared and issued in accordance with legal requirements, based on the list of fields and specializations of undergraduate and master studies, which are annually approved by Government Decision.

Graduates of Bachelor's degree studies are issued **engineer degrees** and the graduates from master studies receive **master's degrees**.

The diploma is accompanied by the **Diploma Supplement (Appendix C16)**, in Romanian and English, in line with the European requirements and the provisions of the Order No. 4868 of the Minister of Education and Research of 07.08.2006. Diplomas are consistent with the academic qualifications regulated by the National Qualifications Framework.

The University POLITEHNICA of Bucharest was part of the consortium implementing the SOPDRU Project no. 2/1.2/S/2, entitled "Development of an Operational System of Qualifications in Higher Education in Romania" – DOCIS, run by ACPART in cooperation with the National Commission for Vocational Qualifications – CNCP, France, and with the University of Bucharest.

Study programs are developed according to the academic qualification requirements, and the syllabi/subject descriptions are developed taking into account the Competency Grids 1 and 2, according OMECTS 5703/2011 and Appendix – Methodology for CNC Implementation in Higher Education



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**Ref.1:** As a result of the University's policies, implemented in close collaboration with the socio-economic environment, educational offer is constantly tailored to meet the current labor market requirements and promote the adequate insertion of graduates of the University.

**Ref.2.** Study programs are reviewed and revised periodically, to make them match the changes in the market of academic and professional qualifications, taking into account similar programs in EU and non EU universities ([Appendix C12](#)). The CEAC and the DMC in the University have jointly established a procedure for the internal audit of the study programs among faculties, so that evaluation of the study programs may be correct and instrumental for their further development ([Appendix C17](#)).

### C.3. - Objective and Transparent Learning Results Evaluation Procedures

Teaching technology upgrading, which includes learning outcomes assessment objectification, is a constant concern in our University. The university has held extensive discussions on the written and/or oral examination, examination during the semester, the role of multiple choice tests etc.

#### C.3.1 Students' Evaluation

Organization of the education system using the credit system (ECTS) has called for the development of rules for the objectification of knowledge evaluation processes, which have later been included in the operating regulations governing the educational process and periodically updated and approved by the Senate of the UPB.

##### C.3.1.1 Regulation on Student's Examination and Performance Scoring

**Min:** UPB Senate approved the final version of the regulations for the organization and running of undergraduate studies in 2013 ([Appendix B4](#)) and for the masters degree studies, in 2014 ([Appendix B5](#)). Both teachers and students are required to comply with the provision of the Regulation. Examination requires compulsory participation of another specialized teacher, in addition to the course owner. Regulations are displayed in a visible place on the notice board of the Secretariat and on the faculty and the University websites. The content of the Regulations has been discussed in the meetings of departments and of the Faculty Board.

**Ref. 1:** According to these regulations, assessment of the knowledge acquired and student graduation are based on a set of scoring and passing rules, which are announced by the discipline lecturer upon the presentation of the subject during the first lesson and are specified also in the subject description and in the Student's Guide. Ongoing evaluations are performed face-to-face or via the e-learning platform ([Appendix B33](#)).



**Ref. 2:** PhD exams, some of the master exams, public presentation of diploma projects, dissertations and doctoral theses are attended also by external examiners from other universities or from interested businesses.

**Ref. 3:** The objectivity and transparency of the student's examination and performance scoring are assessed on an annual basis by the students of each faculty, by means of teacher performance evaluation questionnaires (Appendix C18).

### C.3.1.2 Integration of Examination in Designing the Teaching and Learning Process by Courses and Study Programs

**Min:** Each course is designed so as to combine teaching, learning and examination. The teacher is required as of the first course to specify the organization of the teaching, assessment and grading activities. These are also specified in the subject descriptions.

**Ref. 1:** Regulations (Appendix B4 and B5) are expressly stipulating under the evaluation sections that students are evaluated also during the semester, also specifying that credit acquisition should achieve the balance between the ongoing and the final evaluation. This ensures, on the one hand, the rhythmic training on the way of students, while placing emphasizes on individual study, on understanding and assimilating theoretical and practical knowledge, thus reducing the student's memorizing efforts.

**Ref. 2:** The Regulations have also provided for multiple forms of assessment that encourage students to engage in creative learning through independent work such as homework, projects, studies etc.

## C. 4 - Teaching Staff Regular Performance Evaluations

According to the National Education Law no.1/2011, UPB conducts annual teacher performance evaluations, which comprises three components: **self-assessment**, **peer review and evaluation by students**, based on evaluation forms approved by the UPB Senate: Research and educational performance Self-assessment Form; Peer Review Form; Questionnaires for Teachers' Performance Evaluation by Students; Summary of Evaluation Results.

### C.4.1 Quality of Teaching and Research Staff

The educational process is the **core objective** of the work of the University POLITEHNICA of Bucharest. In the Romanian university environment, our university has undertaken the task to achieve performance through training, research and innovation.

The educational process is tailored not only to national and international requirements, but also to the realities of these times, so as to achieve a high quality education process.



Because the University's great interests in attaining higher levels of quality of teaching, learning and research by comparison with technical universities from abroad, providing qualified human resources is a constant preoccupation of the management team of the UPB, which is determined to attract renowned academics and maintain the high quality standards of its teaching staff.

#### C.4.1.1 Teachers/Students Ratio

At UPB, the teaching of the subjects by teachers with appropriate skills adapted to the specific objectives of the study programs is achieved by applying the methodology on filling in vacant teaching and research positions ([Appendix B16](#)), subject to compliance with the applicable laws. Selection by competence criteria applies to both permanent and associate teachers. Tenure teaches employed in higher education, who retire at age limit or for other reasons and who are working as associate teachers at the University should be assigned one teaching workload at the most at the University.

**Min:** University management and faculty management try to attain the optimal ratio between the number of permanent teachers and the number of students enrolled with the University, such balance being normally achieved through the establishment the schooling rate figures, vacancy policy and through teacher training strategy. In the last four academic years the University has managed to maintain, thanks to a rational human resources policy, a ratio comparable to that attained by similar universities in the country and in the EU between the number of students enrolled and the number of permanent teachers, with 16.7 to 19 students per one permanent teacher ([Appendix C19](#)).

**Ref. 1:** UPB has a careful approach to human resources management, so as to ensure the stability of the teaching staff, and enhance its performance level, thereby warranting that the education and research are running at the established quality standards.

The University provides support to junior teachers who take up teaching courses at the Teacher Training Department, by exempting them from tuition fee.

To maintain the quality standards of the University, the Senate has decided to limit the number of teaching loads per year to 1 ½ at UPB. Engaging in teaching activities in other universities is subject to approval by the UPB Senate, based on a request endorsed by the management of the department and of the relevant faculty and only in duly justified cases.

Depending on knowledge dynamics, UPB teachers have approached new disciplines, a fact proven in particular by the research topics addressed, the scientific production and the publication of teaching materials.

**Ref.2.** Increasing the quality of teaching, learning and research is the top priority of UPB management, with the number of teaching loads and the number of teachers being



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established taking into account the fact that laboratory activities are carried out by subgroups and project topics and homework are individualized. The discipline tenure teachers have as a minimum the academic degree of lecturers and are PhDs or PhD candidates in the discipline they teach. Application coordinators have the initial training and skills in the discipline they teach in the position they occupy in the University.

#### C.4.1.2 Peer Review

**Min:** At UPB, each teacher is subject to an annual peer review. To this end, the University has developed the **Peer Review Form (Appendix C20)**, approved by the University Senate, which contains performance indicators for evaluation of the teaching and research activities and of any other tasks performed for the benefit of the academic community. This latter peer evaluation criterion refers to evaluation of the teacher's performance in terms of his or her involvement in the activities of the department/faculty/university, other than those specified in the teaching workload, teamwork abilities, contribution to department self-financing and to students' guidance, concern and results obtained in increasing the visibility, attractiveness and prestige of the University, a criterion where peer review weighs most heavily.

**Ref.1:** Peer reviews are discussed by members of the department and are then finalized by the Department Board. Peer reviews are prepared using also the information from the Research and Teaching Performance Self-evaluation Form (**Appendix C21**), filled in by each teacher.

Peer review based on performance indicators is one of the several performance evaluation tools, based on which the department sets its policy on teacher promotion, teacher merit gradations etc.

#### C.4.1.3 Teacher's performance Evaluation by Students

**Min:** For each teacher, the opinion of the students on the teaching performance is essential for improving the teaching process. As a result, many teachers use their own questionnaires for their performance assessment by the students or questionnaires developed by departments/faculties.

To generalize this type of performance evaluation and use a standardized questionnaire at UPB (**Appendix C18**), after the determination by the Senate of the content of the assessment form, a performance evaluation application has been developed for each faculty, incorporating all the subjects in the curriculum. The open-source application MOODLE (<http://moodle.org>) has been used for this purpose, containing a personalized feedback component. For all the students of the University, anonymous accounts and passwords have



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been created, allowing them to access the evaluation forms one time only for a given subject in a given period (two weeks after the start of the semester).

**Ref. 1:** The processed results of the performance evaluation are accessible with a password only by their dean of the faculty. The dean then distributes the results by departments and, together with department heads, presents them to the evaluated teachers. The results of Individual assessment are then used by the department, faculty and University to establish corrective measures, where applicable. The results are statistically processed and the Executive Office of the Faculty, based on the consolidated results ([Appendix C22](#)), debriefs the Faculty Board accordingly.

#### C.4.1.4 Evaluation by University Management

**Min:** Each teacher prepares the annual multi-criteria evaluation form, approved by Senate of UPB, based on which the teacher's performance is evaluated by the head of department.

**Ref. 1:** The University requires the multicriteria annual evaluation of each teacher.

For a more objectified evaluation, a teaching and research performance self-evaluation form has been compiled, which is comprehensive enough, especially in terms of scientific work assessment, allowing quantification in the form of a number of points of the national and international publications, research projects and scientific prestige ([Appendix C21](#)).

Assessment results and the scores obtained by each teacher in the performance evaluations are confidential. Every department and every faculty analysis the centralized evaluation results for all teaching positions, based on the form described in ([Appendix C22](#)). Teaching staff promotion and payroll policies involve the review of teachers' performance in terms of their teaching and research work, including the services they provide to the University and to the community.

**Ref.2** Every year, UPB awards by competition the following prizes: OPERA OMNIA for life-long achievements in the University, and IN TEMPORE OPORTUNO for young people with outstanding scientific achievements.



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## C.5 – Accessibility of Learning Resources

### C.5.1 Learning Resources and Student Services

Personal development of students is one of the main goals the University is determined to achieve through its objectives and by increasing the quality of the academic, social and cultural services provided it provides to students.

The students of the UPB benefit from a favorable learning environment, consisting of adequately equipped education and research spaces, a modern and rich library, containing Romanian and foreign books and specialized literature, as well as accommodation and study facilities, scholarships, counseling, sport grounds etc.

#### C.5.1.1 Learning Resource Availability

**Min:** The University provides free learning resources for each program of study at the UPB Central Library (<http://www.library.pub.ro>) and at the libraries of some of the departments, on classic and electronic format.

The building housing the Library and the Conference Centre, inaugurated in 2012, has 3 sections, each performing specific functions, and 48 rooms, of which:

- reading rooms with free access to shelves;
- reading rooms;
- room for computerized documentation;
- 10 deposits (over 2,000 sqm, over 14,000 linear meters of shelves);
- approx. 1400 000 library units (books, periodicals, special collections, standards, audio-visual materials), 453 titles of scientific periodicals, Romanian and foreign, 289 subscriptions to Romanian and foreign scientific periodicals; 14 titles of heritage works;

Thanks to the computerization efforts, the UPB Central Library (BC-UPB) resources are available online, via ALEPH application.

Subscriptions to various specialized magazines include, among other, access to the electronic format of the publication, where the editor so allows. Subscriptions to publications are made based on respect for the traditional collections gathered over the years by the library.

The website of the UPB Central Library presents all existing subscriptions to Romanian and foreign scientific publications (<http://www.library.pub.ro/abonamente.html>).



On the BC-UPB website (<http://www.library.pub.ro/>) there are links to the libraries of other universities that provide free access to doctoral theses, with users being allowed to consult the library's internal documents.

To ensure a diverse documentary fund, the University has signed protocols with various institutions, from which it has received significant donations of technical books. For this purpose, dedicated spaces were created, accommodating publications received as a donation from personalities from the world scientific community or from prestigious publishing houses.

**Ref. 1:** A constant concern of UPB management is to ensure students free access of the students to any learning resource, according to the objectives and requirements of the study programs. Details on learning resources, book fund distribution, periodical subscriptions and book donations are found in ([Appendix C23](#)).

**Ref.2:** Members of the academic community from the University POLITEHNICA of Bucharest **have free online access to scientific databases** under the ANELIS-Plus project. The library has the electronic format of some courses and the e-learning platform Moodle provides access of all students to the documentation for each and every study subject.

Once the access to digital resources granted, the problem of ensuring the required number of volumes for one and the same resource depends on usage and can be adjusted by examining the access statistics over a reasonable period of time.

### C.5.2. Student Services

- *Accommodation facilities:*

Regie and Leu accommodation compounds comprise 28 student hostels with a total capacity 13046 beds. Accommodation of students in dormitories is decentralized by faculties and is fully computerized, thus ensuring its transparency. Each hostel has its own reading rooms and internet access in rooms. Approximately 90% of the students from the country are accommodated in the student hostels of the University.

- *dining facilities;* 6 cafeterias.
- *Sport facilities:*

The University has large sporting complex, stretching over an area of about 45,000 square meters, equipped with 4 gyms, 3 football fields, 2 handball grounds, 3 athlete tracks, 14 tennis courts and 2 volleyball courts. At “Regie” compound, students have access to a fitness hall.

Students are encouraged to participate in sporting events organized by the Department of Physical Education, Sport and Physical Therapy and by the Sports Club “Știința București”, which has UPB has a successful partnership agreement.



- *Healthcare Services*

Students are benefiting from healthcare services provided by the Polyclinic and the medical offices situated on the premises of the “Regie” Compound.

- *Counseling services*

The Center for Counseling and Career Guidance (CCOC) provides candidates, students and alumni with assistance and consulting/guidance services, helping them to familiarize with the UPB’s educational offer and develop the specific skills and competencies they require in order to find the most suitable job for their qualifications.

**Ref.1:** UPB provides various services to its students and has special programs to ensure high standard of living for the students. These services are monitored and evaluated regularly through surveys conducted among students, according to the **Students’ and other Stakeholders’ Satisfaction Survey procedure** ([Appendix C14](#)).

All student associations have free access to learning and research spaces. For the organization of students’ events and competitions, the University puts at the disposal of the students a show room, clubs, auditoriums, the Central Library premises etc.

The church dedicated to Saint Gregorie Palama, located on the university campus, is frequented by many students.

**Ref. 2:** UPB supports scientific research, students’ events and competitions, providing the environment and the resources necessary to perform them. Such events and competitions include: annual proceedings of the students’ scientific clubs, ACM International Collegiate Programming Contest, ROBOCHALLENGE, the math contest “Traian Lalescu”, the “South Eastern European Mathematical Olympiad for University Students” (SEEMOUS) and the "International Mathematical Competition" (IMC).

To develop communication skills in foreign languages, UPB has signed agreements with the Cervantes Institute and with the British Council, under which UPB may get internationally recognized language proficiency certificates.

UPB has an ongoing agreement with the French Cultural Institute, to grant financial support the mobility of the students enrolled in dual diploma study programs.

With AUF, the University has an agreement whereby the UPB organizes an international master’s degree program dedicated to teachers of French.

UPB is constantly caring for the involvement of its students in sports activities and provides the necessary support to maintain and increase the performance of its student sports teams ([Appendix C24](#)) in national and international competitions.



## C.6 - Internal Quality Assurance Database Updating

### C.6.1 Information Systems

#### C.6.1.1 Databases and Information

**Min:** The University POLITEHNICA of Bucharest has an information system which facilitates the gathering, processing and analyzing of data and information that is relevant to the evaluation and assurance of institutional quality. University presents on its website, [www.upb.ro](http://www.upb.ro) information on its institutional quality status.

The UPB has a centralized database and has created a special structure for managing schooling, paying constant attention to the updating of the database with information on the jobs and employers of the graduates of UPB.

Information systems have been implemented in the University for admission (Appendix B23), student management and implementation of the management functions related to all the students of the University, online courses platform, teaching performance evaluation by students (Appendix C18).

**Ref. 1:** The Quality Council, the ECAC and the Quality Commissions of the faculties in UPB keep themselves updated on the quality of education in European universities. Participation of the University in the SOP DRU/155/1.2/S/139950 Project "Improving the quality of national higher education in accordance with changes in the knowledge-based society and labor market dynamics" has allowed a critical analysis of the Quality Management System and specific procedures in Romanian universities and representative universities in the EU.

## C.7. – Transparency of Information on Study Programs, certificates, Diplomas and Specializations

### C.7.1 Public Information

#### C.7.1.1 Public Information Offer

**Min:** The University POLITEHNICA of Bucharest has a wide range of means to disseminate relevant information about the university life.

The main information channel is the University website ([www.upb.ro](http://www.upb.ro)), which is easily accessible. The information contained there is targeted to students and university staff, candidates and to the public at large from the country and from abroad, who is interested in the work of the University POLITEHNICA of Bucharest. In this respect, the websites contains general information: history of the University, the University Charter, the UPB Senate members, the Board members etc.) and in particular specific information (Organizational structure - Types of Degrees, Faculties, Departments, Research centers).



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Teachers can find useful information (Operational Plan, the main decisions of the Senate, Regulations and Methodologies, contests for occupying teaching positions etc.) and the students are informed about the University's rules and regulations (organization and running of the courses, scholarships etc.) and about their rights and obligations. The website also posts relevant data on scientific research conducted at the University.

Each year, detailed information is added, regarding the admission examination (specialization, methodology, number of places etc).

In its relations with universities or other organizations from abroad, the University POLITEHNICA of Bucharest uses a presentation brochure written in English. The brochure is also available in electronic format.

Each faculty has its own web page, with the addresses listed on the homepage of the University website. The faculty webpage describes the departments within each faculty and contain all the relevant data (academic staff, including the CVs, available research facilities, major scientific and technical works, list of scientific papers, patents, books etc.). Students may consult daily timetables, the Student's Guide, the Curriculum of each study program, and may find information on various events, job offers, internships etc. The webpages of some of the faculties also contain courses in electronic format, written by teachers from the relevant faculty. It should also be noted that all faculties have prepared written materials (brochures etc.) specifically intended for dissemination in high schools, to inform future candidates.

**Ref. 1:** The information provided on the website of the University POLITEHNICA of Bucharest is **comparable to that of partner universities**, such as the **CESAER** consortium of the major European technical universities. In addition to the information in Romanian, the website includes a subpage containing relevant data in English. Currently there are under construction subpages containing relevant information in French. The webpage [www.upb.ro](http://www.upb.ro) is also accessible via the appropriate link on the webpage of the CESAER Consortium. Brief info about the university (profile, fields, contacts, addresses etc.) can be found in the (printed) guide of universities worldwide.

**Ref.2:** UPB has its own television station, SIGMA TV, which develops and broadcasts didactic, scientific and informative programs.



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## C.8 - Education Quality Assurance Structures

### C.8.1 Education Quality Assurance Institutional Structure

The Quality Assessment and Assurance Commission (CEAC) is established by law and approved by the UPB Senate. CEAC coordinates the application of the quality assessment and assurance procedures and activities, approved by the Senate, according to domains and criteria stipulated by law.

#### C.8.1.1 Application of Quality Assessment and Assurance Procedures and Actions

**Min:** Procedures and activities dealing with evaluation of education quality have been developed and approved by the University Senate.

The Quality Assessment and Assurance Commission (CEAC) prepares the yearly internal evaluation report and presents it for approval by the UPB Senate, formulating proposals to improve the quality of education, in the form of an action plan ([Appendix C11](#)).

After their approval by the Senate of the University, the said documents are displayed on the UPB website

**Ref. 1.** Through joint actions undertaken with foreign universities (co-tutorship PhDs, Erasmus mobility, research contracts), established under bilateral agreements ([Appendix B31](#)) and through cooperation with universities in Romania, UPB identifies and adopts best practices in the field of education, administration and research.

UPB's partnerships with employers of the University's alumni (industrial companies, banks, municipalities etc.) and with the providers of candidates (national colleges and technical colleges, technical colleges in Bucharest and in the country) generate information to be taken into account in planning, organizing and running of the teaching and research process within the University.



## D. IMPLEMENTATION OF PREVIOUS RQAAHE'S EVALUATION RESULTS

The management of the University POLITEHNICA of Bucharest has taken actions to implement the recommendations made by RQAAHE Commission regarding the continuous improvement in all the activities performed by the University.

### D.1. Commission's Recommendations

**D1.1.** During its previous visit, the RQAAHE Commission has noted the University's efforts to implement computer assisted education and management at UPB. The Commission's recommendations are valid *in general for all the faculties and study programs of the University, including the implementation of a database enabling multi-criteria updating and access.*

In this sense we can mention the following achievements:

#### I. Generalization of the Administrative Information Systems of the Dean Offices

The **Student Management online platform** was developed, designed to keep track of the students. The Platform contains the personal data and education information of the students of the University, required to compile the Student Enrollment Register. The student management system is an application hosted at <http://studenti.pub.ro>, whose role is to record and manage students in the University's management system, to provide electronic support for the management of study programs and education contracts and to provide a tool for **managing all activities** including those regarding student's academic situation, required for the issuance of the **diploma supplement** and of the **graduation diploma**. Several additional functions have been implemented as well, that facilitate the work of University staff: **the generation of catalogs; administration of alumni; reporting across UPB; administration of curricula**; filters for advanced selection of students by their grades, number of failed exams, number of credit points; **student accommodation management**.



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## II. Finance and Accounting Information System

The system managing the financial resources in the process of costs commitment, contracting, acceptance, authorizing payments, payment, sales and receipts was implemented in the University in the period 2007-2009.

The main objective is **a powerful financial and accounting management system**, designed to ensure compliance of the University with current legislation on the use of budget funds by maintaining costs within the approved budgets and by maximizing surplus. The financial accounting information system modules are: Financial Accounting, Accounts Payable, Fixed Assets, Cost Accounting, Cash Management, and Client Accounts.

The main features of the financial and accounting information system are:

**1. Organization of financial accounting:** the chart of accounts can be developed as synthetic and analytic accounts, in the form of trees, with accounts restructuring being performed on the go, without disrupting the system activity.

**2. Budget/financial periods and closing operations.** Every financial year and budgetary/financial period is associated with a continuous calendar timeframe. A special period is the beginning of the financial year, when the opening balances are recorded.

**3. The analytical accounts** are easily prepared owing to the fact that the information system allows the management of analytical issues without the need to develop the chart of accounts. As such, to any account can be assigned from 1 to 3 levels of development, where each level has access to the staff list, partners or to a dictionary of lists of codes developed by the user, such as lists of investments, debtors creditors etc.

**4. Financial Reporting:** account sheets, trial balances, sales and purchase journals, ledger, records of accounts and cash, recapitulation of accounting records etc. , designed to enable data checking and report generation.

**5. Accounts Payable/Client Accounts.** The system allows full analysis of customers and suppliers operations, providing an overview of the partner in its relations with the company. A business partner is assigned a unique code and can act as a provider and a customer. Its relationship with the organization can be reviewed in the Partner financial statement as customer/supplier accounts and on supporting documents.

**6. Control of receipts from customers /payments to suppliers.** The system allows users to enter receipts, in whole or in part, based on the specified invoices or on a set of invoices identified by user-defined criteria.

**7. Management of cashier, treasury and commercial banking operations** allows the administration and management of bank accounts and cash registers in any currency,



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the management payment orders and account statements, as well as real time cash control, control of liquidities by destinations, exception monitoring and fraud elimination.

8. **Commitment of expenditure** is the stage in the financial management where authorization is given to draw from the funds specified in the budgets and/or procurement plan for individual purchases of goods, services and works, and for the organization's overall expenditure (salaries, travels, electricity, water, gas etc.).

9. **Accounting of tangible and intangible assets**, which are long-term assets, is a tool designed to help the organization comply with the legal and tax regulations throughout the lifecycle of the assets, from asset acceptance, depreciation and revaluation to asset decommissioning.

### III. Human Resource Information System

The human resource information system was developed by the University POLITEHNICA of Bucharest, as the coordinator of the research contract no. 48/2004 "A new service offer of the integrated university management information system for human resource management - SIMUGERU", under the RELASIN programs of the National RDI Plan .

This system was implemented in UPB in 2008 and is updated to the ever changing staff and payroll issues. The information system allows the construction of organizational and management models and has the following features:

- **Staff management:** manages a large amount of historical information, identification information, financial information, workplace, payment terms, seniority, contacts, addresses, phone numbers, e-mail, medical data;
- **Organizational models and representations:** organizational charts, organizational chart exporting to various documents: employment contracts, addenda, certificates, formats (XLS, HTML, JPG), list of posts, list of vacancies;
- **Recruitment and selection:** management and collection of data on staff recruitment, staff recruitment methods, job applications, information about candidates, recruitment agencies, staff recruitment and selection officers (external or internal);
- **Payroll and training:** Data on education, specialization, training, training methods, training objectives, functions and stages;
- **Performance evaluation:** management and collection of data on allocation of performance and effectiveness evaluation indicators and percentages;
- **Payroll items modeling:** bonuses, time worked/not worked, deductions, taxes by employee/unit.



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#### IV. Resource Management Information System

Material Resources Information Management System was developed under the research / INNOVATION Contract No. 183/2008, "Integrated System for Material Resources Management - SIMREM" by the University POLITEHNICA of Bucharest, as partner, and was implemented in the University during the period 2010- 2011.

By implementing the resource management information system, the following problems have been **greatly diminished**:

- long procurement times;
- financial bottleneck generated by delay and impossibility to settle invoices at the due dates established under research contracts (planned progress reports);
- obsolescence of products due to delayed delivery;
- lack of on-line information, which generates dissatisfaction of the beneficiaries of the purchased products.

The system addresses the supply of stocks, inventory items, work and protection equipment, property (tangible and intangible), as well as the supply of the full range of services.

The system provides updated information to the management to help with the taking timely decisions relative to the purchase of products or services, effective control of consumption of resources, better management of stocks and effective collaboration with suppliers.

The economic benefits of the use of the integrated resource management system include:

- **reducing the processing time** for demand reports / requests for purchase;
- **reducing the effort of data uploading** owing to the possibility to visualize the procurement process as a whole;
- **reducing the operating times** by entering documents once only in one single database;
- **full visualization of the supply flow** and automatic execution of tax receipts;
- **automatic control** over stock levels;
- **reducing consumption of supplies** by generating detailed reports on purchase orders carried out on a given period of time.

**D.1.2.** Another recommendation deals with *installation of fixed multimedia systems* in all classrooms, to increase student satisfaction.

In its efforts to ensure a modern education system and optimal conditions for study and the development of educational facilities, the University has paid particular attention to the



upgrading of education facilities. Thus, in addition to the equipment in place at the time of the previous institutional assessment visit, all auditoriums and lecture rooms have been fitted in recent years with specific multimedia equipment, by **purchasing a total of 551 projectors and screens.**

**D.1.3.** The evaluation commission has appreciated the constant preoccupations of the University to refurbish and upgrade the campus premises (faculty premises, labs, and hostels) and recommended it to take *effective actions to enhance UPB campus security*

As such, the University has taken the following security increase actions:

- a) **externalization of UPB security and access services;**
- b) **installation and use of specific security facilities:**
  - **intercoms and badge access to all student hostels;**
  - **video surveillance systems connected to a video monitoring center;**
  - **access surveillance and control systems in educational spaces** (e.g. at the faculties of Electrical Engineering, Energy, Automation, Electronics, IMST);
  - **alarm systems** in all laboratories and spaces accommodating valuable equipment

**D.1.4.** Another recommendation is the pay *more attention to peer review.*

The University has put in place procedures approved by the Senate for teacher performance evaluation.

Peer evaluation is carried out using a specific form containing the performance indicators for the evaluation of teaching and research performance and of the teacher's academic community services and is based on the Research and Teaching Self-assessment Form developed by each teacher ([Appendix C21](#)) and in consultation with department members. Evaluations proposed by the Department Board are discussed by the Department staff. The evaluation indicator dealing with the teacher's involvement in the activities of the department / faculty / university, other than the activities included in teaching tasks, and his or her teamwork ability, contribution to department self-financing and to student guidance, involvement in and results of the teacher's efforts to enhance the visibility, attractiveness and prestige of the University, is the part that counts most in the peer review.

Peer review is a tool used alongside other assessment systems to define the departmental policy regarding promotion of teachers, award of merit gradations etc.

**D.1.5.** Discussions held with the evaluation commission with employers have resulted into several recommendations regarding **enhancement of the complementary skills of the graduates of the University:**



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### **D1.5.1.** *Enhance graduates' communication skills, including communication in the English language*

In this regard, note should be made that the University does its utmost to transfer its graduates the skills required for a quick insertion in the labor market. To enhance student's foreign language proficiency, UPB has signed a collaboration agreement with the British Council, with the French Cultural Institute and with the Cervantes Institute, under which University students enjoy preferential fees for enrolling in language courses and obtaining certificates of linguistic competence.

### **D1.5.2.** *Promote employment of students for internships purposes*

The University took account of this recommendation. However, it does not encourage employment of students during the academic year because, in most of the cases, such employment leads to poor performance.

Following the implementation of the new internship system (12 weeks at the end of 3<sup>rd</sup> academic year), UPB has signed agreements with over 500 companies, with potential future employment opportunities.

## **D2. External Evaluator's Recommendations**

The external evaluator has made recommendations regarding the human resources policy, the development of the organizational framework for technology transfer and the increase of the importance given to alumni associations (other recommendations are included in the Commission's recommendations).

Below is a description of measures implemented according to these recommendations.

### **D2.1.:** *Creating the internal organizational framework for a quicker development and promotion of young teachers and the developing of a new policy of financial and professional stimulation of young teachers*

In this regard, we highlight the following:

a) The human resources policy of the University is focused on attracting valuable graduates and increasing the share of young teachers in the total staff of the University by organizing competitions for vacant teaching positions and encouraging promotion of young teachers in the teaching hierarchy of the University. Valedictorians of each academic year were offered employment with UPB, to pursue doctoral studies and choose a teaching career.



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Many young teachers have met the criteria for being promoted to lecturer and professor positions and have been encouraged to obtain authorization to coordinate doctoral studies.

b) For financial stimulation purposes, the Board of Directors decided in 2012 to increase the salaries of the University's teachers. The increase was granted differently, namely: 12% for assistants, 7% for lecturers and 5% for professors.

Other financial support measures are:

- 11 food vouchers per month to assistants
- Accommodation at preferential fee in student's family hostels for assistants and work coordinators

c) By its seven doctoral and postdoctoral fellowship programs of the UPB, financed from EU SOPHRD funds, the University has provided fellowships and training courses and has encouraged attendance to conferences and preparation of works, which helped students meet the promotion criteria in a shorter time.

## **D2.2.** *Development of the organizational framework for Technology Transfer and Innovation*

One of the specific objectives of the UPB in terms of research is the **development of the applicative character of the research and the technology transfer for achieving results, including through a closer collaboration with relevant businesses by their field of activity**

UPB has established a Department for Innovation and Technology Transfer, which coordinates specific activities. UPB was present at numerous international invention fairs and exhibitions, obtaining many medals and prizes ([Appendix B40](#)).

## **D2.3.** *Increase the importance placed with alumni associations*

Strengthening cooperation relations between the university graduates and promoting collaborative relationships among UPB, its graduates and the socio-economic environment are important goals set by Alumni Associations in the various faculties of the University (e.g. Electrical Engineering, Engineering and Management of Technological Systems, Automation and Computers, Engineering in Foreign Languages etc.). These associations plan to support innovative initiatives in education and research, encourage excellence in education, facilitate the exchange of experience between different generations of alumni, provide counseling to students on career development and support the integration of recent graduates in the social and economic environment. And last but not least, the graduates' insertion on the labor market insertion. The associations advocate for strengthening the professional and scientific authority and increasing the social prestige of the profession.



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#### **D2.4.** *Development of a centralized system to quantify and experience gained during study tours abroad and to use it across UPB*

Doctoral internships, Erasmus mobility of teachers, participation in international scientific events and in the activities carried out by various working groups under European projects, visits to various universities or research centers and the technology transfer and innovation are all leading to the accumulation of valuable knowledge. This knowledge can be used:

- in doctoral schools,
- at departmental scientific seminars
- at Department, Faculty Board or Senate level

### **D3. Student's Recommendations**

#### **D3.1.** *Actual implementation of the ECTS system*

ECTS is fully implemented across the University, a fact demonstrated by the provisions of the regulations on the organization and running of bachelor's and master's studies and of the regulation on recognition of foreign education ([Appendixes B4, B5, and B30](#)).

#### **D3.2.** *Student-oriented education and a better correlation between the content of the courses in the first two years of studies and the professional expectations*

Personal development of the students is one of the University's goals, which is achieved by designing student-centered learning methods and environments.

In the period 2010 – 2012, the study programs were reviewed in order to facilitate registration of new university qualifications in the National Register of Qualifications in Higher Education. This approach was based on the strict correlation between subject content and the requirements of qualification to be acquired by graduates, in line with labor market demand. The process has involved the definition of professional and transversal competences, the development of curriculum and subject descriptions and consultations with employers.

#### **D3.3.** *Student's Satisfaction Survey Questionnaires*

The University has in place mechanisms by which students can evaluate teaching, learning environment and educational path. Students have access to the relevant section on the UPB Moodle Platform and to the survey questionnaires developed by faculty management or by the teachers.

#### **D3.4.** *Faculty website upgrade and update*



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Every individual faculty has taken actions to improve its webpage and permanent care is paid to ongoing updating of the information for students, faculty staff and other stakeholders (candidates, potential research partners, alumni etc.). System engineers in every faculty handle website management and information updates.

#### 4. Final Conclusions

The University POLITEHNICA of Bucharest takes constant actions to assure the quality of all its internal processes and comply with the relevant laws and regulations both at institutional level and in terms of study programs. Quality increase across the entire institution is proved by the University's scoring better in terms of the key performance indicators in the current performance evaluation compared to the previous evaluation.