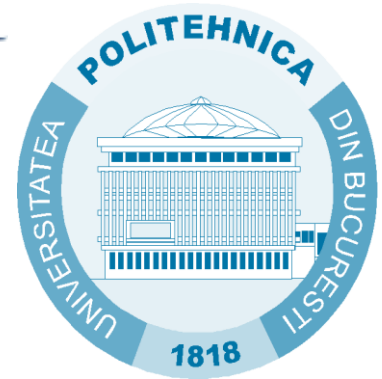
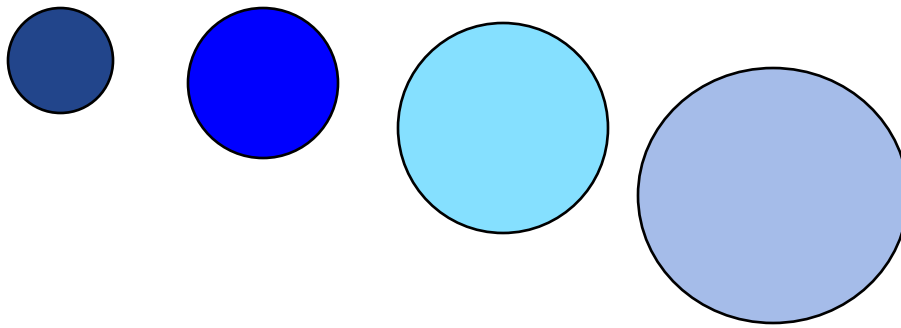


# The role of research in the University

*Prof.dr.ing.* **Ioana FĂGĂRĂȘAN**

Faculty of Automatic Control and Computers  
University POLITEHNICA of Bucharest

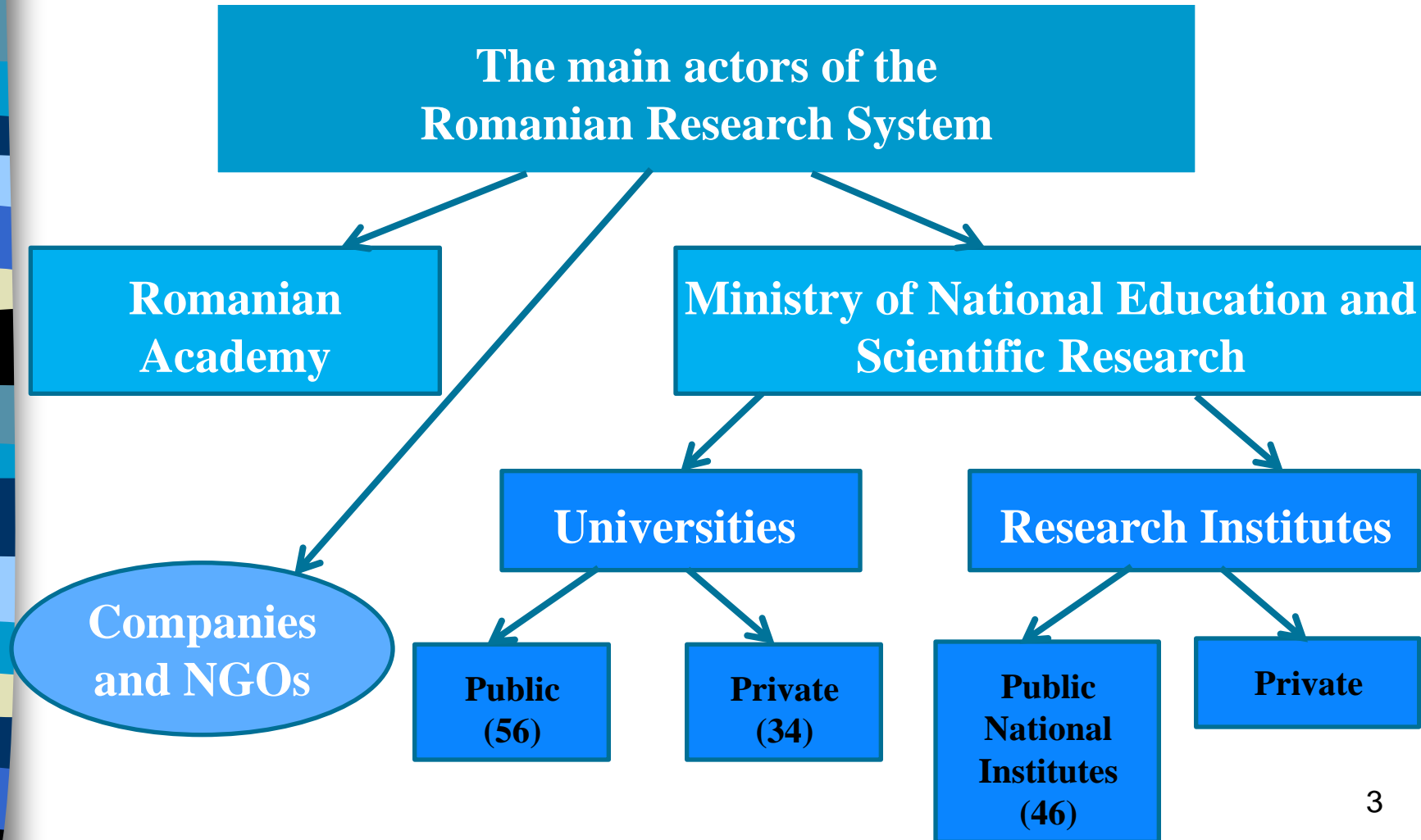


## *Summary*

- General Framework*
- Research at UPB*
- Evaluation of Research*
- Conclusion*



# General Framework



# *General Framework*



University POLITEHNICA of Bucharest is:

- a public university
- a research university

*Research universities* have been defined as academic institutions “committed to the creation and dissemination of knowledge, in a range of disciplines and fields, and featuring the appropriate laboratories, libraries, and other infrastructures that permit teaching and research at the highest possible level”



# *General Framework*

The research universities played complex roles in the academic system, including the core mission of *research production and training students to be engage in research.*

*Creating knowledge mainly by scientific research*, giving it out by education and professional training, disseminating it by information technologies, as well as the use of technological innovation are elements that define the research university distinctive profile.

The *research* is carried out inside university and *in collaboration* with other entities, using public or private funds or sponsorship from non-university sources.



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# General Framework

*Public research funding entities*



MINISTERUL EDUCAȚIEI ȘI  
CERCETĂRII ȘTIINȚIFICE

*Ministry of Education and Scientific Research*



*Ministry of European Funds*



*National Authority  
for Scientific  
Research and  
Innovation*



*Executive  
Agency for  
Higher  
Education,  
Research,  
Development  
and Innovation  
Funding*



*Romanian Space  
Agency (ROSA)*



# *Research at UPB*



The mission of the University POLITEHNICA of Bucharest has been thought over as a mixture of **education, research and innovation**, which represents a key towards a knowledge-based society and economy.

Its specificity relies in **creating knowledge through research and technological innovation**, as well as through its implementation by means of education and professional training at an European level.

The **engineering profession** must be continuously transformed and adapted itself to the new demands of the society.



# *Research at UPB*



The scientific research in UPB is offering national and international visibility and professional recognition.

UPB defined certain strategic orientations of the scientific research, derived from the competencies of our human resources and relied to our research infrastructure, available in our research centers, departments and laboratories.

These orientations are well harmonized with our fields and domains in the university present and perspective educational process.





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# Research at UPB

*Infrastructure*



**FACULTY** → **DEPARTMENTS** → **LABORATORIES**

## 15 different faculties:

1. Electrical Engineering
2. Power Engineering
3. Automatic Control and Computer Science
4. Electronics, Telecommunications and Information Technology
5. Mechanical Engineering and Mechatronics
6. Engineering and Management of Technological Systems
7. Biotechnical Systems
8. Transports
9. Aerospace Engineering
10. Material Science and Engineering
11. Applied Chemistry and Materials Science
12. Engineering in Foreign Languages
13. Applied Sciences
14. Medical Engineering
15. Entrepreneurship, Business Engineering and Management



# Research at UPB

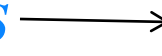
## Infrastructure



**FACULTY**  
(15)



**DEPARTMENTS**  
(54)



**LABORATORIES**  
(150)

### 15 different faculties:

- |   |  |
|---|--|
| 1. Electrical Engineering                                       | 8. Transports  |
| 2. Power Engineering  | 9. Aerospace Engineering                                     |
| 3. Automatic Control and<br>Computer Science                    | 10. Material Science and<br>Engineering                      |
| 4. Electronics,<br>Telecommunications<br>Information Technology | 11. Applied Chemistry and<br>Materials Science               |
| 5. Mechanical Engineering and<br>Mechatronics                   | 12. Engineering in Foreign<br>Languages                      |
| 6. Engineering and Management<br>of Technological Systems       | 13. Applied Sciences   |
| 7. Biotechnical Systems   | 14. Medical Engineering                                      |
|   | 15. Entrepreneurship, Business<br>Engineering and Management |

### Studies Programs:

- The Bachelor
- The Master
- The Ph.D. programs



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# Research at UPB

*Infrastructure*



**FACULTY** → **DEPARTMENTS** → **LABORATORIES**  
**RESEARCH CENTERS (53)**

Electrical Engineering	6
Power Engineering	3
Automatic Control and Computer Science	4
Electronics, Telecommunications and Information Technology	7
Mechanical Engineering and Mechatronics	3
Engineering and Management of Technological Systems	8
Biotechnical Systems Engineering	2
Aerospace Engineering	1
Material Science and Engineering	3
Transports	5
Applied Chemistry and Materials Science	4
Engineering in Foreign Languages	2
Applied Sciences	3
Entrepreneurship, Business Engineering and Management	2



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# Research at UPB

## Infrastructure



**FACULTY** → **DEPARTMENTS** → **LABORATORIES**

**RESEARCH INSTITUTES**

*Research Center for Advanced Materials, Innovative Products and Processes - CAMPUS, co-financed by the European Regional Development Fund starting in 2012 (includes 41 laboratories) <http://www.campus.upb.ro/>*

*Research Center for Smart Innovative Products, Processes and Services- PRECIS, co-financed by the European Regional Development Fund starting in 2014 (includes 28 laboratories) <http://precis.acs.pub.ro/proiect/>*



P·R·E·C·I·S





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# Research at UPB

## Infrastructure



## CENTRAL LIBRARY OF UPB



LEGATURI

INFORMATII UTILE

ELIBERARE PERMISE DE BIBLIOTECA,

VIZE, FISE DE LICHIDARE

**NEW** Trial-uri baze de date

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Termeni si conditii de utilizare a revistelor electronice



# *Research at UPB*

## *Infrastructure*



### *THE SCIENTIFIC BULLETIN*

Founded in 1929, “The Scientific Bulletin” edited by University POLITEHNICA of Bucharest has managed along its 80 years of existence to gather in its pages the most remarkable scientific contributions of professors and PhD students.

Approaching an extremely diversified line of topics from engineer sciences, the Bulletin is structured today in 4 series, with 4 numbers/year and special editions.

Series A - Applied Mathematics and Physics (ISI index)

Series B - Chemistry and Materials Science (IDB index)

Series C - Electrical Engineering and Computer Science (IDB index)

Series D - Mechanical Engineering (IDB index)



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# *Research at UPB*

## *Infrastructure*



### *Publishing House POLITEHNICA PRESS*

UPB is represented in the editorial field by *Politehnica Press Publishing House*.

Since 2001 the Publishing House role is to promote the results of research conducted in the University POLITHNICA of Bucharest, published works sometimes representing the materialization of several years of assiduous research.





# Research at UPB

## Human Resources



- students (aprox. 28.000)
  - The Bachelor of Science programs in 17 major fields and more than 70 distinct specializations, with a duration of 4 years
  - The Master of Science programs in more than 170 specializations, with a duration of 2 years
  - The Ph.D. Programs in 14 fields of Engineering Science, with a duration of 3 years
- teaching and research staff,
  - administrative staff (aprox. 2.300)





# Research at UPB

## Strategy



UPB aims to become a top university in South-Eastern Europe in scientific research and also as a centre of competence, knowledge and competitiveness.

To achieve these objectives a strategy was developed and contains 11 possible actions:

1. concentrate the scientific activities from specific areas of the university in an potentially high level theoretical and applied results, included in the Research Institute "Politehnica", while maintaining and strengthening the autonomy of research centers with significant results in theirs activities;
2. stimulating internal competition within the university;
3. awarding remarkable scientific results;
4. development of performance by raising standards of scientific research in doctoral schools from each faculty;



# Research at UPB

## Strategy



UPB aims to become a top university in South-Eastern Europe in scientific research and also as a centre of competence, knowledge and competitiveness.

To achieve these objectives a strategy was developed and contains 11 possible actions:

5. supporting the establishment of research groups in interdisciplinary areas;
6. involving top students from the Polytechnic University of Bucharest in several research groups;
7. internationalization of scientific research;
8. compiling a database on scientific production performance of the UPB research staff;
9. establish priority research topics from Horizon 2020 as strategic objectives for the activity of scientific production inside the university;



# Research at UPB

## Strategy



UPB aims to become a top university in South-Eastern Europe in scientific research and also as a centre of competence, knowledge and competitiveness.

To achieve these objectives a strategy was developed and contains 11 possible actions:

10. the development of scientific research and innovation activity, in order to promote the technology transfer in different fields related to Horizon 2020 strategy as a priority for developing industrial capacity;
11. supporting and promoting research activities that are considering innovative products and services and that provide business opportunities and improve people's lives through the creation of spin-off companies / start-up.



# Research at UPB

## Statistics



The total figures for UPB in a 3 years period:

- ❑ 1203 new R&D applications for public and international calls for projects, with the rate of success of approx. 50%
- ❑ 2064 national public funded R&D contracts, 183 international public funded R&D contracts, 168 companies financed R&D contracts
- ❑ 582 PhD thesis finalized
- ❑ 1338 papers in ISI quoted revues, 1101 papers in other Indexed Data Bases (SCOPUS, Engineeringvillage, IEEE) quoted revues, 3699 papers published in proceeding of international major conferences
- ❑ 951 scientific books publised in Romania and abroad
- ❑ 87 grated patents



# Research at UPB

## Dissemination



The research activity in UPB is followed by dissemination actions trying to increase the visibility of the research work :

- by national and international experts from UPB
- by graduates, some of them with scholarships funded by economic entities or international foundations
- specialized local, national or international journals
- conferences, workshops or symposium at national or international levels
- collaborations with public, private or associations entities
- conference and interviews in specialized and public mass-media



# *Evaluation of Research*



Evaluation of research in terms of Quality Assurance benchmarks is based on quantifiable indicators that underline the impact of **research activity** and professional recognition :

- Books and chapters in books published in national and international recognized publishing houses
- Articles in ISI journals and in ISI proceedings
- Articles in journals and proceedings of indexed in other international databases (SCOPUS, IEEE, ACM, Springer, etc)
- Intellectual Property Rights, Patents, Certificates
- Grants / projects awarded by competition at national or international level



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# *Evaluation of Research at UPB*



Evaluation of research in terms of Quality Assurance benchmarks is based on quantifiable indicators that underline the impact of research activity and **professional recognition** :

- Citations in books, journals and proceedings ISI or IDB
- Invited plenary presentations in national and international scientific events
- Visiting Professor award
- Member of the editorial board or scientific committees of the journals or member of the organizing committees for international scientific event indexed ISI or BDI
- Community awards, Membership in professional organizations



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# *Evaluation of Research at UPB*



Evaluation of research in terms of Quality Assurance benchmarks is used for:

- highlighting some notable results
- university ranking and prestige
- personal development of students, graduates and academic staff
- academic staff promotion and awards
- accessing the public funding for the university
- accessing the private additional funding for the university





# Evaluation of Research at UPB



Evaluation of research in terms of Quality Assurance is supervised at national level by specific entities:

☐ *National Council for Attesting  
Titles, Diplomas and Certificates  
(CNATDCU)*

- the council includes 35 Committees for each particular fields with specific criteria for evaluate training and reasearch activities in the field, as well as profesional recognition

3	Recunoașterea și impactul activității (A3)	Cărți în cărți, reviste și volume ale unor manifestări științifice		A3.1.1	cărți, ISI	8 / re aut art.	
				A3.1.2	BDI	4 / re aut art.	
		Prezentări invitate în plenul unor manifestări științifice naționale și internaționale și Profesor invitat	Pondaj unic pentru fiecare activitate	A3.2.1	internaționale		
				A3.2.2	naționale		
		Membri în colecțiile de redacție sau comitete științifice al revistelor, organizator de manifestări științifice, internaționale indesele ISI	Pondaj unic pentru fiecare activitate	A3.3.1	ISI		
				A3.3.2	BDI		
				A3.3.3	naționale și internaționale reindesale		
				A3.4.1	Academia Română, ASTR, academii de ramură, premii internaționale		
				A3.4.2	premiu național în domeniu		

2. Formula de calcul a indicatorului de merit (A = A1+A2+A3)

$$A = \sum_i k_{1i} + \sum_i k_{2i} + \sum_i k_{3i}$$

unde:  $k_{\mu}$  – Indice specific tipului și categoriei de activitate

3. Condiții minime (A)				
Nr. crt.	Domeniul de activitate	Conferențiar	CS II	P
A1	Activitatea didactică / profesională (A1)	50	Fără restricții	
A2	Activitatea de cercetare (A2)	250	300	
A3	Recunoașterea impactului activității (A3)	50	50	
TOTAL (A)		350	350	

Condiții minime obligatorii pe subcategorii				
		Conferențiar	CS II	P
A1.1.1 - A1.1.2	Cărți și capitole în cărți de specialitate	2 cărți / capitole	2 cărți / capitole	4 cărți
A1.2.1-A1.2.2	Material didactic / Lucrări didactice	1	Fără restricții	
A2.1	Articole în reviste cotate și în volumele unor manifestări științifice indesele ISI proceedings	6	6	
A2.4.1	Granturi/proiecte castigate prin competiție (Director / responsabil)	1	2	
A3.1.1 - A3.1.2	Numar de cărți în cărți, reviste și volume ale unor manifestări științifice ISI sau BDI	10	10	
	Factor de impact cumulat pentru publicații	3	3	



# *Evaluation of Research at UPB*



Evaluation of research in terms of Quality Assurance is supervised at national level by specific entities:

- ❑ *National Scientific Research Council (CNCS)* - fostering excellence in scientific research in Romania
- ❑ *The Board of Ethics and University Management (CEMU)* - pronouncement on ethical disputes in university
- ❑ *National Council for Higher Education Financing (CNFIS)* – assists the MECS to formulate proposals on the future funding needs of higher education, as well as the annual distribution of budgetary funds for public higher education institutions in Romania.



# *Evaluation of Research*



In conclusion, the evaluation of research is a dynamic process in continuous improvement and adjustment.

Now several standards are in place for:

- Academic staff evaluation
- Journals evaluation
- Publishing houses evaluation
- Conferences/Symposium/Workshop evaluation



# Conclusions



The university research activities and results are key elements for:

- satisfaction of requirements of the real economy
- practice foundation for engineering disciplines included in different trainings programs
- creating of the new fields of research advancing training and research in the universities
- students, graduates and staff developments as a means for enhancing quality
- attract additional funding for reasearch in the university
- adapting curricula and engineering studies to market requirements and incorporate new and innovative topics