

**UNIVERSITY OF BUCHAREST**

**Department of Technologies**  
**Faculty of Biology**  
**Faculty of Physics**  
**Faculty of Geography**

**offers the Master of Science Degree (M.S.) in**

## **AIR-ENVIRONMENT RISKS AND HEALTH RESPONSE**

**an inter-domain program of academic studies in English**  
(linking Physics, Chemistry, Biology, Geography and Medicine),  
concerned with the impact of air - environmental conditions on human  
health and well-being



## Legal Status

The M.S. program in *Air-Environment Risks and Health Response* is fully accredited both by the Natural Sciences and by the Medical Sciences Commissions of the Romanian Agency for Quality Assurance in Higher Education Council (ARACIS).

## Mission

The mission of the M. S. program in *Air-Environment Risks and Health Response* is not only to provide outstanding scholarship across the spectrum of physical and environmental sciences, with the aim of improving the quality of the open and close air-environments in which people live and work, but also to train highly-qualified professionals to substantially contribute to effectively increasing the scientific knowledge and better managing the air-environment risks on human health and well-being.

## Strategic Objectives

The M. S. program in *Air-Environment Risks and Health Response* at the University of Bucharest is **the only one training program in Romania** providing graduates with the scientific, technological, policy and management knowledge and skills for basic and applied work needed to address contemporary and emerging issues in environmental sciences and health.

## Specific Objectives

The M. S. program in *Air-Environment Risks and Health Response* deals holistically with how exposure to various air-environmental conditions, risks and pollutants may adversely affect human health. The core curriculum provides the unifying themes on the basic driving forces behind environmental health problems, human activities that lead to pressures on the air-environment and effects of exposure to degraded atmosphere and air-environmental conditions on human health and well-being. The program stresses environmental health practice and research into areas of specialization, including Physics, Chemistry, Biology, Meteorology and Climatology, Air Pollution, Epidemiology, Risk Assessment and Environmental Management. Teaching in the *Air-Environment Risks and Health Response* program is supported by a large and diversified research portfolio with state-of-the-art equipment and facilities. The MS degree is geared for students seeking research careers and serves as a doctoral preparatory program.

## Job Titles (according to ISCO08\_ILO)

The University of Bucharest has a good record for career placement. Graduates are employed by local, state, national and international agencies; industry; consulting firms; private organizations and academic institutions. Listed are just a few of the job titles:

- ✓ Environmental Protection Professionals
- ✓ Conservation Scientist
- ✓ Environmental Adviser
- ✓ Environmental Auditor
- ✓ Environmental Consultant
- ✓ Environmental Research Scientist
- ✓ Environmental Scientist
- ✓ Safety, Health and Quality Inspectors
- ✓ Environmental remediation specialist
- ✓ Air Pollution Analyst
- ✓ University and Higher Education Teachers
- ✓ Research Manager

## Admission

**Program Name :** **Air-Environment Risks and Health Response**

**Administrative Structure :** Faculty of Geography (Meteorology and Hydrology Department)

**Address :** 1, Nicolae Balcescu Av. 010041 Bucharest, sector 1 ROMANIA

**Phone / Fax :** +40-21-3153074 / +40-21-3153074

**Web-page :** [www.unibuc.ro](http://www.unibuc.ro) ; [www.geo.unibuc.ro](http://www.geo.unibuc.ro)

**Contact person :** Prof. dr. **Nicoleta IONAC** (Head of the Meteorology and Hydrology Department)

**E-mail :** [nicoleta@geo.unibuc.ro](mailto:nicoleta@geo.unibuc.ro))

**Leading to the degree of :** M.S.

**Admission Limited to :** Fall 2010 for the academic year 2010-2011  
Exceptions only in special cases.

**Deadline to apply :** September 11<sup>th</sup>

## Admission Requirements :

In addition to the University's Master Program admission requirements (see [www.unibuc.ro](http://www.unibuc.ro) ), all applicants are expected to submit the **program application** and a **statement of purpose** through the Faculty of Geography (Meteorology and Hydrology Department).

In addition to **applicants who hold a bachelor's (or master's) (or equivalent) degree** in Physics, Chemistry, Biology, Geography, Environmental Sciences, Medicine or other appropriate field, those with a degree in other related disciplines, such as General Physical Science, Engineering, Geophysics, Health Physics, Astronomy and Space Science, Meteorology, Military Disciplines etc. are also encouraged to apply.

The applicants may be **Romanian or foreign citizens** from EU member-states, EEC member-states, Switzerland or other non-EU countries.

The **applicants from non-EU countries are recommended to prepare and submit their application file and statement of purpose in advance**, in order to catch up with the processing procedures at the Ministry of Education and Research in Romania and at the ministries of education in their home countries, by the deadline to apply. Exceptions are allowed only in special cases.

For **further enquiry on admission conditions, foreign applicants may contact:**

The Foreign Relations Department at the University of Bucharest

Tel. +40-21-3077322

(Contact person: Mrs. Filuta Ionita) E-mail: [filuta.ionita@unibuc.ro](mailto:filuta.ionita@unibuc.ro)

## Foreign Language Requirements :

As the **teaching language of the M.S. program is English, all applicants must provide a Certificate of knowledge of the English language (Level B1).**

Applicants may also submit a Test of English as a Foreign Language (TOEFL), an International English Language Testing System (IELTS), a Cambridge Certificate or any other certificate of competence in English issued by an accredited authority.

Applicants whose native language is English or English is the official language of their home countries are excepted from the above-mentioned requirement.

Applicants who graduated a bachelor's (or master's) program in English are also excepted.

In Bucharest, applicants may submit a test of the English language at the:

University Centre for Modern Languages

(Ministry of Education and Research and University of Bucharest).

Address: 1, Schitu Magureanu Blvd., 2<sup>nd</sup> floor, room 14, Bucharest. Sector 5.

Tel./Fax: +40-21-3125454

## Admission Examination:

Applicants for the M. S. program in *Air-Environment Risks and Health Response* at the University of Bucharest **must submit an interview on one of the following topics, at applicant's choice, in English. Upon request, in special cases, foreign applicants may submit an on-line interview.**

The corresponding theme references are also presented as follows:

### Physics:

1. Report to the General Assembly - pp. 1-17 from:  
United Nations Scientific Committee on the Effects of Atomic Radiation:  
UNSCEAR 2000, *Report to the General Assembly, with scientific annexes*, Volume I: SOURCES  
Web-page: [http://www.unscear.org/unscear/en/publications/2000\\_1.html](http://www.unscear.org/unscear/en/publications/2000_1.html)
2. Heat and heat transfer, J.H Lienhard IV and J.H. Lienhard V pp.18-47 (paragraphs 1.2 & 1.3 )  
Web-page: <http://web.mit.edu/lienhard/www/ahttv131.pdf>

### Chemistry:

1. The Gas Phase and Gas Phase Chemical reactions  
Web-page: <http://www.wpi.edu/Academics/Depts/Chemistry/Courses/General/concept5.html>
2. Reaction Stoichiometry  
Web-page: <http://www.wpi.edu/Academics/Depts/Chemistry/Courses/General/concept8.html>
3. Principles of Chemical Equilibrium  
Web-page: <http://www.wpi.edu/Academics/Depts/Chemistry/Courses/General/concep12.html>

### Biology:

1. The Effect of Urban Air Pollution on Inflammation, Oxidative Stress, Coagulation and Autonomic Dysfunction in Young Adults, Kai-Jen Chuang et al., in the *American Journal of Respiratory and Critical Care Medicine*, vol. 176, April 2007, pp. 370-376  
Web-page: <http://ajrcm.atsjournals.org/cgi/content/full/176/4/370>
2. Air-Pollution and Neonatal deaths in Sao Paolo, Brazil, C.A. Lin et al., *Brazilian Journal of Medical and Biological Research* (2004) 37:765-770  
Web-page: <http://www.scielo.br/pdf/bjmr/v37n5/5202.pdf>
3. Health Effects of Air-Pollution, Vinod Mishra (2003)  
Web-page: [http://www.mnforsustain.org/climate\\_health\\_effects\\_of\\_air\\_pollution\\_mishra\\_pern.html](http://www.mnforsustain.org/climate_health_effects_of_air_pollution_mishra_pern.html)
4. Adverse Cardiovascular Effects of Air-Pollution, Nicholas L. Mills et al., *Nature Clinical Practice: Cardiovascular Medicine*, Jan. 2009, vol. 6, nr.1, MacMillan Publishers  
Web-page: [www.nature.com/clinicalpractice/cardio/journal/v6/n1/pdf/ncpcardio1399/pdf](http://www.nature.com/clinicalpractice/cardio/journal/v6/n1/pdf/ncpcardio1399/pdf)

### Geography:

1. Climate in Peril - A popular Guide to the Latest IPCC Reports – UNEP, 2009 (English - .pdf format)  
Web-page: <http://www.unep.org/pdf/0903ClimateInPerilfinaldraft.pdf>

### Environmental Sciences:

1. Climate Change. Science Compendium, Catherine McMullen, UNEP, 2009, pp. 1-12, 33-42, 43-53  
Web-page :  
[http://www.unep.org/pdf/ccScienceCompendium2009/cc\\_ScienceCompendium2009\\_full\\_highres\\_en.pdf](http://www.unep.org/pdf/ccScienceCompendium2009/cc_ScienceCompendium2009_full_highres_en.pdf)

## Advising

Before the first year of graduate study is completed, students choose a principal academic adviser. This adviser assists the students in creating a profile of study that satisfies both the University and their own personal requirements. The adviser also serves as the chair for the student's departmental guidance committee for the preparation and evaluation of his dissertation thesis. Evaluations of the academic progress of each student are made each September, when the graduate advisers, sitting as a committee, review student records, formally apprise students of their progress, and assist them in making future plans. The graduate advisers are also available throughout the year to meet with students as required.

## M.S. Program Duration

2 academic years: 4 semesters x 14 wks., starting from October 1<sup>st</sup> 2010.

Semester 4 is exclusively dedicated to research activities and completion of the dissertation thesis.

## Course descriptions

In addition to the general public and environmental health education, students will acquire advanced knowledge and understanding about:

-  Influence of weather and climatic conditions on human health and well-being.
-  Mechanisms of major weather and climatic risks.
-  Nature of biological, physical and chemical hazards in air.
-  Transport, transformation and fate of contaminants in the atmosphere.
-  Fundamental basis of exposure, dose and response.
-  Contribution of air-environmental risk factors to disease burden in the community.
-  Sampling and analytical techniques used to monitor contaminants and stressors in the air.
-  Risk assessment and risk management, including applications in policy and decision-making.
-  Role of epidemiology in the identification, analysis and control of air-environmental hazards.
-  Policies, laws and regulations addressing environmental contaminants and stressors, and the enforcing governmental agencies.
-  Economic, policy, political and technical aspects of management and decision-making pertaining to environmental quality and health.
-  Professional practice and ethics in industry, government, and/or nongovernmental organizations.

Domain	Type of course	COURSES	Course description
P	B - M	Atmosphere Physics	Semester I Lecture : 2 hrs./wk Laboratory : 2 hrs./wk
C	B - M	Air Chemistry and Pollution	Semester I Lecture : 2 hrs./wk Laboratory : 2 hrs./wk
B	B - M	Medical Ecology	Semester I Lecture : 2 hrs./wk Laboratory : 2 hrs./wk
G	B - M	Human Biometeorology and Bioclimatology	Semester I Lecture : 2 hrs./wk Laboratory : 2 hrs./wk
B	S - M	Epidemiology and Air-Pollution Risk Assessment	Semester II Lecture : 2 hrs./wk Laboratory : 2 hrs./wk
P	S - M	Global Climate Changes	Semester II Lecture : 2 hrs./wk
G	S - M	Atmospheric Disasters and Emergency Intervention	Semester II Lecture : 2 hrs./wk Laboratory : 2 hrs./wk
C	S - M	Air Quality Monitoring	Semester II Lecture : 2 hrs./wk Laboratory : 2 hrs./wk
h	S - M	Air Quality Monitoring	Semester II Lecture : 2 hrs./wk Laboratory : 2 hrs./wk
P	B-M	Air-Pollution Models	Laboratory : 2 hrs./wk Semester III
B	S - M	Air-Pollution Impact on Human Health	Lecture : 2 hrs./wk Laboratory : 2 hrs./wk Semester III
P	S - E	Ionizing Radiation Pollution: Sources, Doses and Effects	Lecture : 2 hrs./wk Laboratory : 2 hrs./wk Semester III
P	S - E	Electromagnetic, UV, Sound and Optical Pollution	Lecture : 2 hrs./wk Laboratory : 2 hrs./wk Semester III
G	S - M	Climate Change Impact on Human Health	Lecture : 2 hrs./wk Laboratory : 2 hrs./wk Semester III
C	S - E	Occupational Pollution Prevention and Control	Lecture : 2 hrs./wk Laboratory : 2 hrs./wk Semester III
h	S - E	Sustainable Development and Air Quality	Lecture : 2 hrs./wk Laboratory : 2 hrs./wk Semester III
M	C - M	Elements of medical biophysics and environmental medicine	Lecture : 2 hrs./wk Semester IV
M	C - M	Reproductive and fetotoxic effects of air contaminants	Lecture : 2 hrs./wk Semester IV
	P	Research Activity / Field-work (6 hrs./week X 14 weeks = 84 hrs.)	Tutorial (supervised research or other scholarly work), 6 hours per week
	P	Completion of the Dissertation Thesis	Tutorial (supervised research or other scholarly work), 6 hours per week

B = Basic  
 S = Specialty  
 C = Complementary  
 P = Practical works  
 M = Mandatory  
 E = Elective

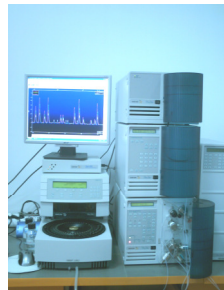
## M.S. Program Study and Research Facilities:

Study in the *Air-Environment Risks and Health Response* program is supported by a large and diversified research portfolio with state-of-the-art equipment and facilities. All laboratories are equipped with modern research and IT equipments, also offering students free access to various on-line international scientific data bases.

The M.S. Students will perform their practical woks, tutorials and research activities in the following laboratories:

### Faculty of Physics:

- **Atmosphere Physics and Environmental Protection Laboratory**
- **Nuclear Radiation Dosimetry Laboratory**
- **X and Gamma Spectroscopy Laboratory**
- **IT Centre for the Investigation and Management of Radiation Risks**



## Department of Technologies:

### ■ Laboratory of Environmental Quality Monitoring and Control



## Faculty of Geography :

### ■ Meteorology and Climatology Laboratory

### ■ BIOCLIMALAB - Bioclimatic Research Laboratory



## Faculty of Biology:

- Molecular Biology Laboratories
- Cell Culture Laboratories
- Cell Biology Laboratory
- Analytical and Preparative Biochemistry
- Biochemistry Laboratories



## Thesis Plan

Every master degree program requires the **completion of an approved dissertation thesis in English**, that demonstrates the student's ability to perform original, independent research. Each student submits his program of study to the department prior to the beginning of the second academic year. Subject to the approval of the student's guidance committee, the thesis plan may be amended, repeatedly and at any time, based on course offerings and evolving interests.

The thesis is graded on the basis of critical, creative and independent thought.

The **Final Examination (Defense of Dissertation)** is required for all students in the program.

[www.unibuc.ro](http://www.unibuc.ro)